

HP ProLiant DL585 Server User Guide



April 2005 (Fifth Edition)
Part Number 358707-005

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About This Guide

This guide provides step-by-step instructions for installation and reference information for operation, troubleshooting, and future upgrades for the HP ProLiant DL585 Server.

Audience assumptions

This guide is for the person who installs, administers, and troubleshoots servers. HP assumes you are qualified in the servicing of computer equipment and trained in recognizing hazards in products with hazardous energy levels.

Important safety information

Before installing this product, read the *Important Safety Information* document included with the server.

Symbols on equipment

The following symbols may be placed on equipment to indicate the presence of potentially hazardous conditions:



WARNING: This symbol, in conjunction with any of the following symbols, indicates the presence of a potential hazard. The potential for injury exists if warnings are not observed. Consult your documentation for specific details.



This symbol indicates the presence of hazardous energy circuits or electric shock hazards. Refer all servicing to qualified personnel.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure. Refer all maintenance, upgrades, and servicing to qualified personnel.



This symbol indicates the presence of electric shock hazards. The area contains no user or field serviceable parts. Do not open for any reason.

WARNING: To reduce the risk of injury from electric shock hazards, do not open this enclosure.



This symbol on an RJ-45 receptacle indicates a network interface connection.

WARNING: To reduce the risk of electric shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.



This symbol indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists.

WARNING: To reduce the risk of injury from a hot component, allow the surface to cool before touching.



These symbols, on power supplies or systems, indicate that the equipment is supplied by multiple sources of power.

WARNING: To reduce the risk of injury from electric shock, remove all power cords to completely disconnect power from the system.



Weight in kg
Weight in lb

This symbol indicates that the component exceeds the recommended weight for one individual to handle safely.

WARNING: To reduce the risk of personal injury or damage to the equipment, observe local occupational health and safety requirements and guidelines for manual material handling.

Rack stability



WARNING: To reduce the risk of personal injury or damage to the equipment, be sure that:

- The leveling jacks are extended to the floor.
 - The full weight of the rack rests on the leveling jacks.
 - The stabilizing feet are attached to the rack if it is a single-rack installation.
 - The racks are coupled together in multiple-rack installations.
 - Only one component is extended at a time. A rack can become unstable if more than one component is extended for any reason.
-

Symbols in text

These symbols may be found in the text of this guide. They have the following meanings.



WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.



CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents essential information to explain a concept or complete a task.

NOTE: Text set off in this manner presents additional information to emphasize or supplement important points of the main text.

Related documents

For additional information on the topics covered in this guide, refer to the following documentation:

- The hardware installation and configuration poster that ships with the server
- The documentation CD, which includes the following resources:
 - *HP ProLiant Servers Troubleshooting Guide*
 - *HP Smart Array 5i Plus Controller and Battery-Backed Write Cache Enabler User Guide*
 - *HP Integrated Lights-Out User Guide*
 - *HP ROM-Based Setup Utility Guide*
 - *HP ProLiant DL585 Server Maintenance and Service Guide*

Getting help

If you have a problem and have exhausted the information in this guide, you can get further information and other help in the following locations.

Technical support

Be sure to have the following information available before you call HP:

- Technical support registration number (if applicable)
- Product serial number
- Product model name and number
- Applicable error messages
- Add-on boards or hardware
- Third-party hardware or software
- Operating system type and revision level

HP contact information

For the name of the nearest HP authorized reseller:

- In the United States, call 1-800-345-1518.
- In Canada, call 1-800-263-5868.
- In other locations, refer to the HP website at <http://www.hp.com>.

For HP technical support:

- In North America:
 - Call 1-800-HP-INVENT (1-800-474-6836). This service is available 24 hours a day, 7 days a week. For continuous quality improvement, calls may be recorded or monitored.
 - If you have purchased a Care Pack (service upgrade), call 1-800-633-3600. For more information about Care Packs, refer to the HP website at <http://www.hp.com>.
- Outside North America, call the nearest HP Technical Support Phone Center. For telephone numbers for worldwide Technical Support Centers, refer to the HP website at <http://www.hp.com>.

HP website

The HP website has information on this product, as well as the latest drivers and flash ROM images. You can access the HP website at <http://www.hp.com>.

Server features

The HP ProLiant DL585 Server is the ideal solution for enterprise customers who require a rack optimized, four-way server that delivers outstanding performance and high levels of availability for highly complex, business-critical applications.

Outstanding performance levels are achieved through superior engineering design and the use of such industry-standard technologies as:

- AMD® Opteron™ processors with HyperTransport™ technology

IMPORTANT: Mixing processor speeds and cache sizes is not supported.

- PC2100 and PC2700 ECC double data rate (DDR) synchronous dynamic RAM (SDRAM)
- PC3200 ECC DDR SDRAM
- 64-bit, PCI-X I/O subsystem
- Dual embedded Gigabit Ethernet network interface controller (NIC) with pre-boot execution environment (PXE) support and Wake-on-LAN (WOL)
- Embedded Smart Array 5i Plus Controller with support for 64-MB fully transportable with Battery-Backed Write Cache Enabler (BBWCE) option
- Redundant hot-pluggable fans with N+1 redundancy
- Redundant hot-pluggable power supplies with optional power supply installed

The HP ProLiant DL585 Server achieves unparalleled ease of manageability and serviceability with the following:

- Integration of standard remote management capability through Integrated Lights-Out (iLO) technology
- Virtually toolless and cableless mechanical design
- ROM-Based Setup Utility (RBSU)
- Redundant ROM
- Innovative advanced diagnostic capabilities (QuickFind diagnostic display) for troubleshooting at the server level
- Rapid deployment rack rails
- Efficient and space-saving dense form factor (4U height is 17.8 cm [7 in.])
- Advanced ECC memory protection that corrects all single-bit errors and some multi-bit errors

Server operations

Powering up the server

To power up the server, press the Power on/Standby button.

Powering down the server



WARNING: To reduce the risk of personal injury, electric shock, or damage to the equipment, remove the power cord to remove power from the server. The front panel Power on/Standby button does not completely shut off system power. Portions of the power supply and some internal circuitry remain active until AC power is removed.

IMPORTANT: If installing a hot-plug device, it is not necessary to power down the server.

1. Back up the server data.
2. Shut down the operating system as directed by the operating system documentation.

3. If the server is installed in a rack, press the UID LED button (1) on the front panel. Blue LEDs illuminate on the front and rear of the server.
4. Press the Power on/Standby button (2) to place the server in standby mode. When the server activates standby power mode, the system power LED changes to amber.

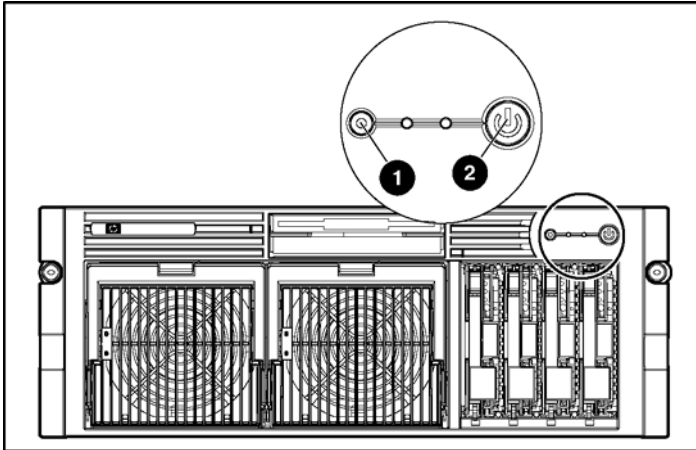


Figure 2-1: Identifying the UID LED (1) and Power on/Standby buttons (2)

5. If the server is installed in a rack, locate the server by identifying the illuminated rear UID LED button.
6. Disconnect the power cords.

The system is now without power.

Locating and removing the Torx T-15 tool

1. Locate the Torx T-15 tool on the back of the server.
2. Slide the tool upward out of the retaining clips.

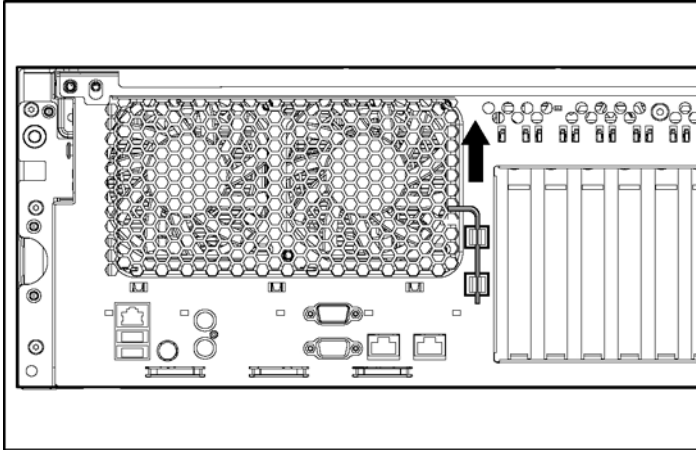


Figure 2-2: Removing the Torx T-15 tool

Extending the server from the rack

1. Loosen the thumbscrews that secure the server to the front of the rack.

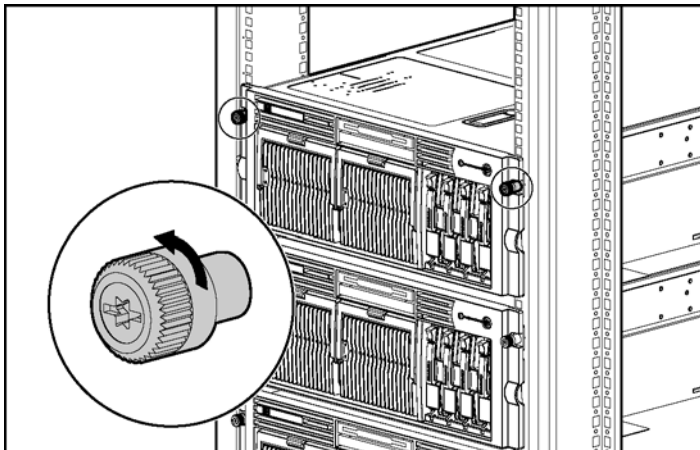


Figure 2-3: Loosening the front panel thumbscrews

2. Extend the server on the rack rails until the server rail-release latches engage.

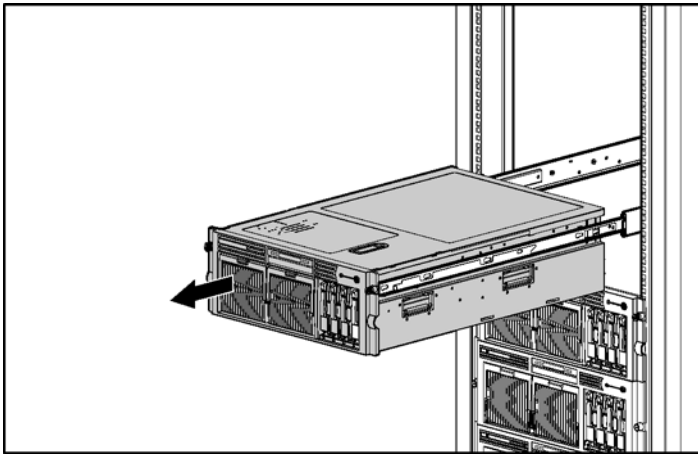


Figure 2-4: Extending the server from the rack



WARNING: Be careful when pressing the rail-release levers and sliding the component into or out of the rack. The sliding rails could pinch your fingertips.

3. After performing the installation or maintenance procedure, press the rail-release levers at the front of both server rails and slide the server into the rack.

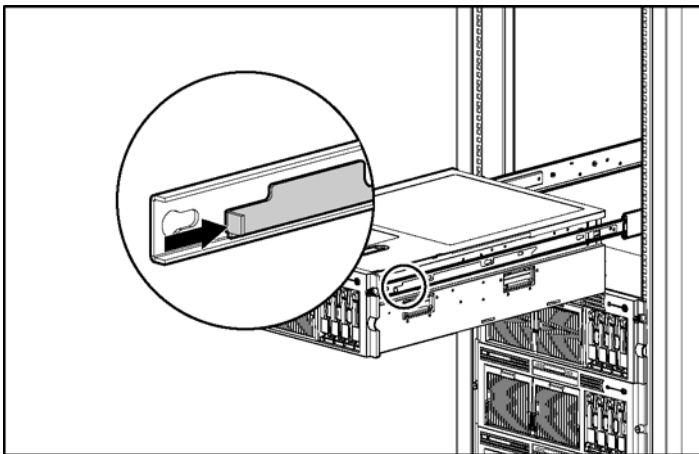


Figure 2-5: Sliding the server into the rack

4. Secure the server by tightening the thumbscrews.

Removing the access panel



WARNING: Pressing the Power on/Standby button sets the server to the standby position, which removes power from most areas of the server. However, portions of the power supply and some internal circuitry remain active until the AC power cord is removed.



WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.



CAUTION: Electrostatic discharge can damage electronic components. Properly ground yourself before beginning any installation procedure.

1. Power down the server. Refer to the “Powering down the server” section in this chapter.
2. Extend the server from the rack. Refer to the “Extending the server from the rack” section in this chapter.
3. Unlock the access panel latch.
4. Lift up on the latch, and remove the access panel.

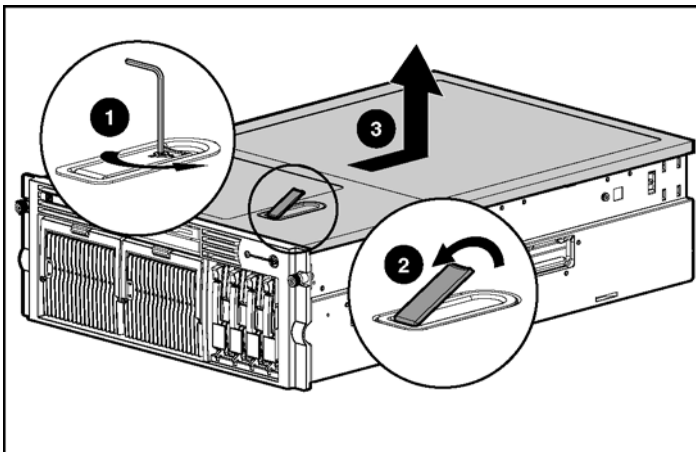


Figure 2-6: Removing the access panel

Installing the access panel

1. Place the access panel on top of the server with the latch open. Allow the panel to extend past the rear of the server approximately 1.25 cm (0.5 inches).
2. Push down on the latch. The access panel slides to a closed position.

Optional installation services

You can choose to have HP install the system. The installation service can be purchased as a Care Pack packaged service or as a customized service agreement to meet your specific requirements. Some of the Care Pack services are as follows:

- Hardware installation services
- Hardware and operating system installation for ProLiant servers
- Installation and start-up services for some operating systems
- Installation and start-up services for HP Systems Insight Manager

This optional hardware installation service is available in all countries where HP has a direct or indirect service presence. Service can be ordered from and directly provided by an authorized service reseller, or in the United States only, service can be ordered by calling 1-800-633-3600. In the United States, HP makes all the arrangements to have the system installed by qualified guaranteed service providers. For more information, refer to the HP website at <http://www.hp.com/hps>.

Rack planning resources

The rack resource kit ships with all HP 9000, 10000, and H9 series racks. A summary of the content of each resource follows:

- Custom Builder is a Web-based service for configuring one or many racks. Rack configurations can be created using:
 - A simple, guided interface
 - Build-it-yourself mode

For more information, refer to the HP website, <http://www.hp.com>.

- The Installing Rack Products video provides a visual overview of operations required for configuring a rack with rack-mountable components. It also provides the following important configuration steps:
 - Planning the site
 - Installing rack servers and rack options
 - Cabling servers in a rack
 - Coupling multiple racks
- The Rack Products Documentation CD enables you to view, search, and print documentation for HP and Compaq branded racks and rack options. It also helps you set up and optimize a rack in a manner that best fits your environment.

Optimum environment

When installing the server in a rack, select a location that meets the environmental standards described in the following sections.

Space and airflow requirements

To enable servicing and adequate airflow, observe the following spatial requirements when deciding where to install the rack:

- Leave a minimum clearance of 63.5 cm (25 inches) in front of the rack.
- Leave a minimum clearance of 76.2 cm (30 inches) in the back of the rack.
- Leave a minimum clearance of 121.9 cm (48 inches) from the back of the rack to the rear of another rack or row of racks.

HP servers draw in cool air through the front door and expel warm air through the rear door. Therefore, the front and rear rack doors must be adequately ventilated to allow ambient room air to enter the cabinet, and the rear door must be adequately ventilated to enable the warm air to escape from the cabinet.



CAUTION: To prevent improper cooling and damage to the equipment, do not block the ventilation openings.

The HP 9000 and 10000 series racks provide proper server cooling from flow-through perforations in the front and rear doors that provide 64% open area for ventilation.



CAUTION: When using a Compaq branded 7000 series rack, you must install the high airflow rack door insert [P/N 327281-B21 (42U) and P/N 157847-B21 (22U)] to provide proper front-to-back airflow and cooling.



CAUTION: If a third-party rack is used, observe the following additional requirements to ensure adequate airflow and to prevent damage to the equipment:

- Front and rear doors: If the 42U server rack includes closing front and rear doors, you must allow 5,350 sq cm (830 sq in) of holes evenly distributed from top to bottom to permit adequate airflow (equivalent to the required 64% open area for ventilation).
 - Side: The clearance between the installed rack component and the side panels of the rack must be a minimum of 7 cm (2.75 inches).
-

Temperature requirements

To ensure continued safe and reliable equipment operation, install or locate the system in a well-ventilated, climate-controlled environment.

The maximum recommended ambient operating temperature (TMRA) for most server products is 35°C (95°F). The temperature in the room where the rack is located must not exceed 35°C (95°F).



CAUTION: To reduce the risk of damage to the equipment when installing third-party options:

- Do not permit optional equipment to impede airflow around the server, increase the internal rack temperature beyond the server, or increase the internal rack temperature beyond the maximum allowable limits.
 - Do not exceed the manufacturer's recommended ambient operating temperature.
-

Power requirements

The installation of this equipment must be in accordance with local/regional electrical regulations governing the installation of information technology equipment by licensed electricians. This equipment is designed to operate in installations covered by NFPA 70, 1999 Edition (National Electrical Code) and NFPA 75, 1992 Edition (code for Protection of Electronic Computer/Data Processing Equipment). For electrical power ratings on options, refer to the product rating label or the user documentation supplied with that option.



WARNING: To reduce the risk of personal injury, fire, or damage to the equipment, do not overload the AC supply branch circuit that provides power to the rack. Consult the electrical authority having jurisdiction over the wiring and installation requirements of your facility.



CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

When installing more than one server, you might need to use additional power distribution devices to safely provide power to all devices. Observe the following guidelines:

- The power load must be balanced between available AC supply branch circuits.
- The overall system AC current load must not exceed 80% of the branch circuit AC current rating.
- Do not use common outlet strips for this equipment.
- Provide a separate electrical circuit for the server.

Grounding requirements

For proper operation and safety, the server must be properly grounded. In the United States, you must install the equipment in accordance with NFPA 70, 1999 Edition (National Electrical Code) Article 250, as well as any local and regional building codes. In Canada, the equipment must be installed in accordance with Canadian Standards Association, CSA C22.1, Canadian Electrical Code. In all other countries, the installation must follow any regional or national electrical wiring codes, such as the International Electrotechnical Commission (IEC) 364, parts 1 through 7. Furthermore, you must ensure that all power distribution devices used in the installation—such as branch wiring and receptacles—are listed or certified grounding-type devices.

Because of the high ground leakage currents associated with multiple servers connected to the same power source, HP recommends the use of a power distribution unit (PDU) that is either permanently wired to the branch circuit of the building or includes a non-detachable cord that is wired to an industrial-style plug. NEMA locking-style plugs or those complying with IEC 60309 are considered suitable for this purpose. HP does not recommend using common power outlet strips for this equipment.

Rack warnings and cautions



WARNING: To reduce the risk of personal injury or equipment damage, be sure that:

- The leveling jacks are extended to the floor.
- The full weight of the rack rests on the leveling jacks.
- The stabilizers are attached to the rack for single-rack installation.
- The racks are coupled together in multiple-rack installations.
- Only one component is extended at a time. A rack can become unstable if more than one component is extended for any reason.



WARNING: Always mount the heaviest item on the bottom of the rack and work from the bottom to the top.

Installing hardware options

Install any hardware options before initializing the server. For options installation information, refer to the option documentation. For server-specific information, refer to Chapter 4, “Installing hardware options.”

Removing shipping bracket from PCI slots

To remove the shipping bracket from the PCI slots, loosen the thumbscrew and remove and discard the shipping bracket.

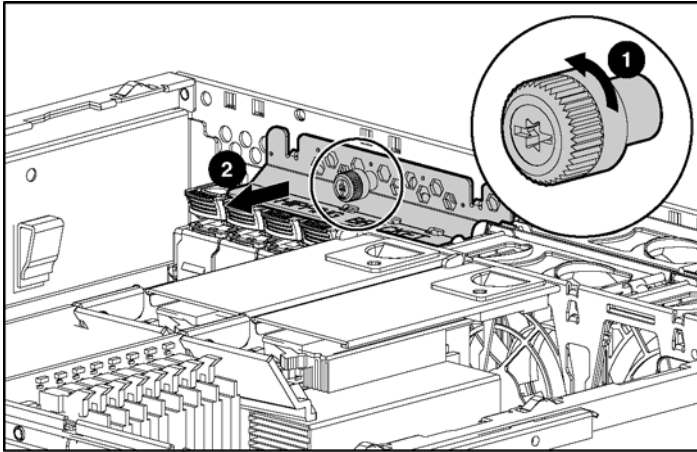


Figure 3-1: Removing the shipping bracket

NOTE: The shipping bracket is used only to secure the PCI-X latches during shipment.

Server shipping contents

Unpack the server shipping carton, and locate the materials and documentation necessary for installing the server. All the rack-mounting hardware necessary for installing the server into the rack is included with the rack or the server.

The contents of the server shipping carton include:

- Server
- Setup documentation, Documentation CD, and software products
- Power cords
- Rack-mounting hardware

In addition to these supplied items, you might need:

- Application software diskettes
- Options to be installed

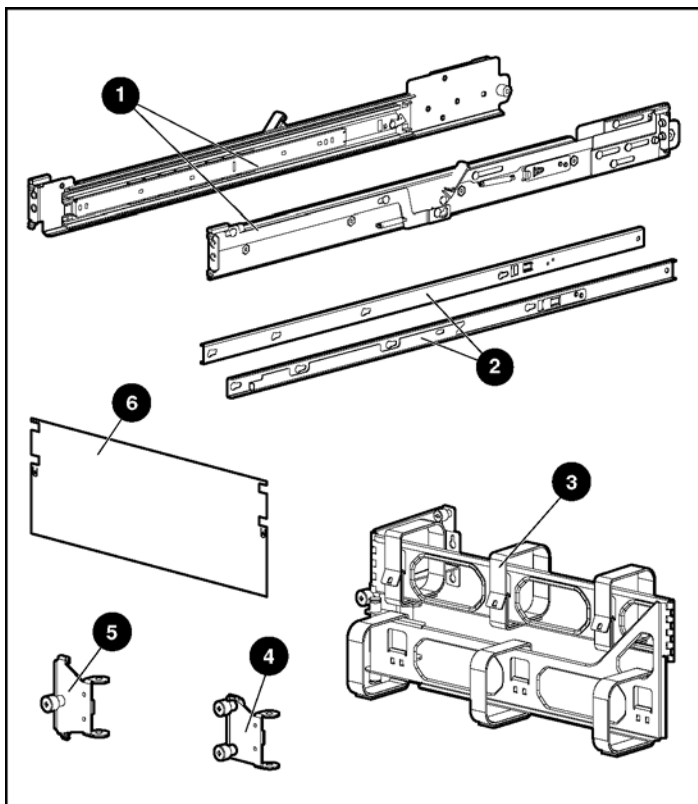


Figure 3-2: Rack-mounting hardware

Table 3-1: Rack-mounting hardware

Item	Description	Item	Description
1	Rack rail assemblies (2)	4	Round-hole bracket
2	Server rails (2)	5	Square-hole bracket
3	Cable management arm	6	Rack template

Installing the server into the rack

Follow the steps in this section if you are installing the server into a rack with square holes. If you are installing the server into a rack with round holes, order the appropriate rack installation option kit, and then refer to the installation instructions that ship with the option kit for more information.

If you are installing the server into a telco rack, order the appropriate option kit at the RackSolutions.com website. Follow the server-specific instructions on the website to install the rack brackets. After installing the brackets, follow the steps in this section.



WARNING: When installing the server in a telco rack, be sure that the rack frame is adequately secured to the top and bottom of the building structure.

1. Mark the rack.



WARNING: Always plan the rack installation so that the heaviest item is on the bottom of the rack. Install the heaviest item first, and continue to populate the rack from the bottom to the top.

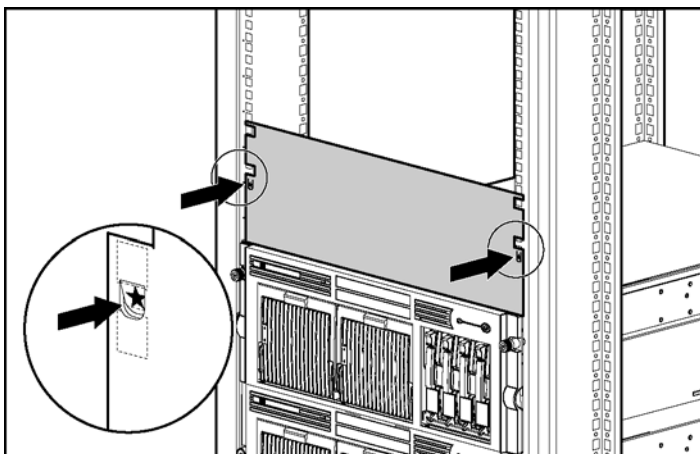


Figure 3-3: Measuring with the template

2. From the front of the rack, identify the rear rack holes on the inside of the vertical rack that you marked with the template.
3. Pull the rail compression lever toward you.

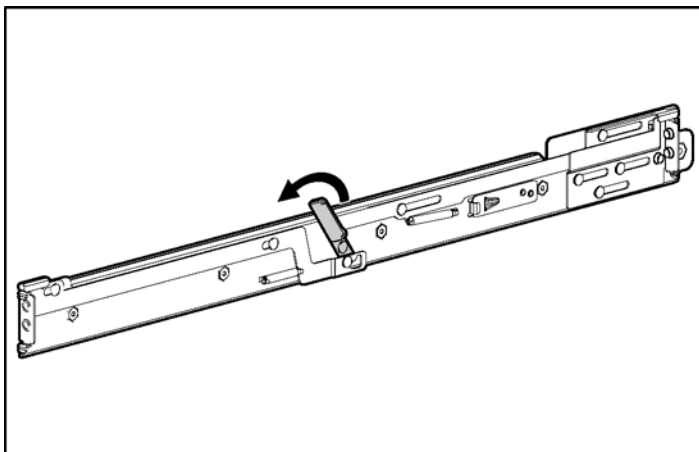


Figure 3-4: Pulling the rail compression lever

4. Insert the two rail tabs from the end of the rack rail assembly into the marked holes on the inside of the rear of the rack.

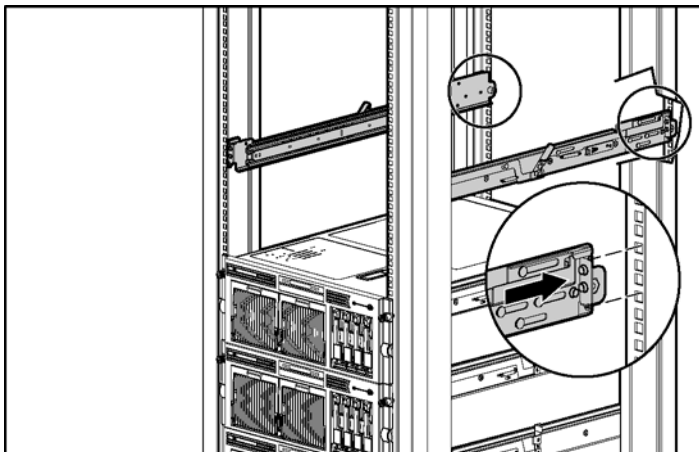


Figure 3-5: Inserting the rail tabs on the rear of the rack

5. Adjust the rack rail depth by sliding it forward.
6. Insert the two rail tabs from the rack rail assembly into the marked holes on the inside of the front of the rack.

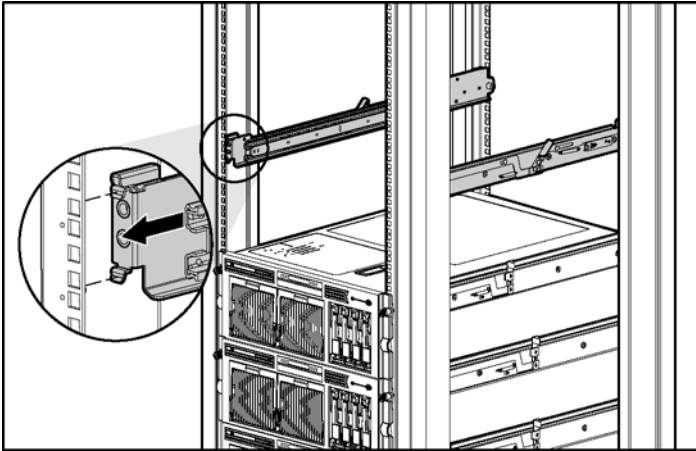


Figure 3-6: Inserting the rail tabs on the front of the rack

7. Release the rail compression lever to seat the tabs in the rack post.
8. Repeat steps 2 through 7 for the other rail.

9. Attach the server rails to the server.

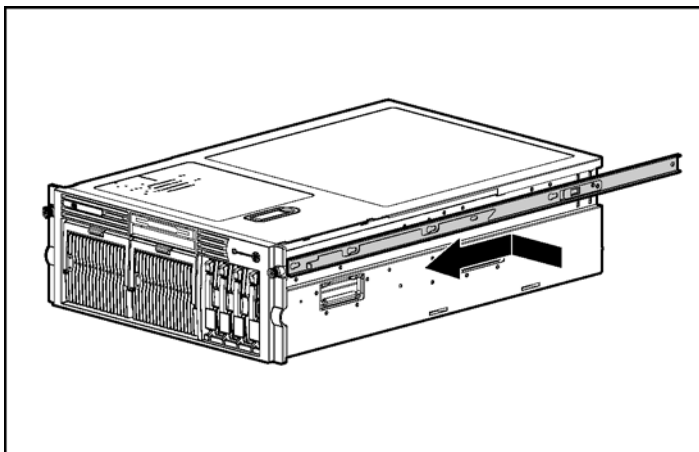


Figure 3-7: Attaching a server rail to the server



WARNING: The server is very heavy, up to 44.5 kg (98 lb). To reduce the risk of personal injury or damage to the equipment:

- Remove all hot-plug power supplies to reduce the weight of the server before lifting it.
- Observe local occupational health and safety requirements and guidelines for material handling.
- Get help to lift and maneuver the server.

10. Remove the power supplies. For more information, refer to the “Removing a redundant hot-plug power supply or blank” section in Chapter 4, “Installing hardware options.”

11. Pull the inner slide rail forward from each rack rail assembly until it locks into place.
12. Slide the inner bearing brace forward until it stops.

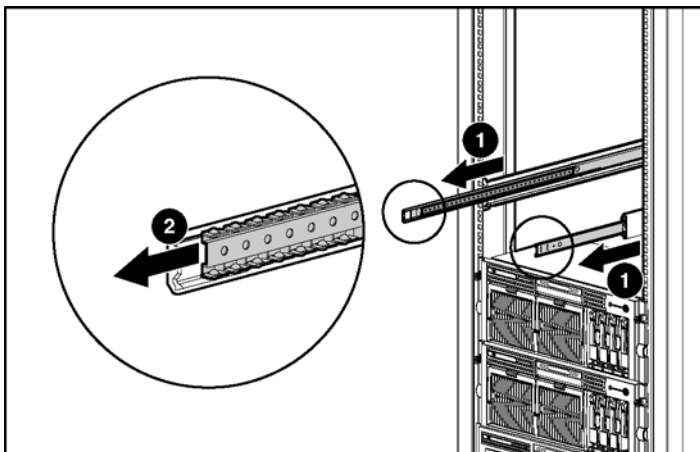


Figure 3-8: Locking the inner slide rails into place



CAUTION: Keep the server parallel to the floor when sliding the server rails into the standard rack rails. Tilting the server up or down can result in damage to the rails.

13. Lift the server using the four lift handles on the sides of the server.
14. Align the server, and carefully insert the server rail into the inner slide rail until the rail-release levers engage.

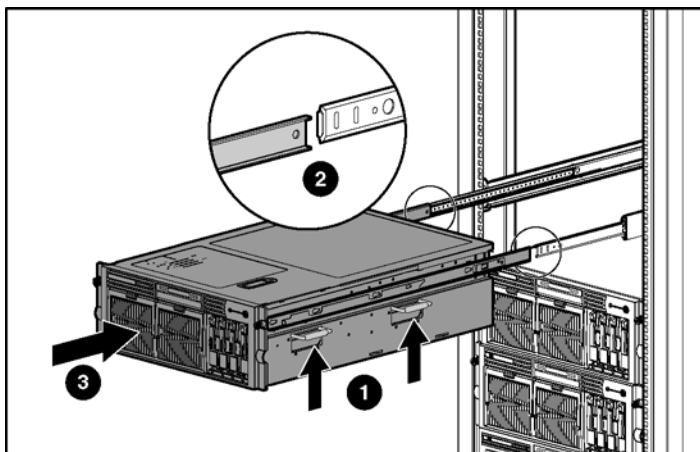


Figure 3-9: Loading the server onto the rack rails

15. Reach around the front of the server to press the rail-release levers at the front of both server rails, and continue to slide the server into the rack.

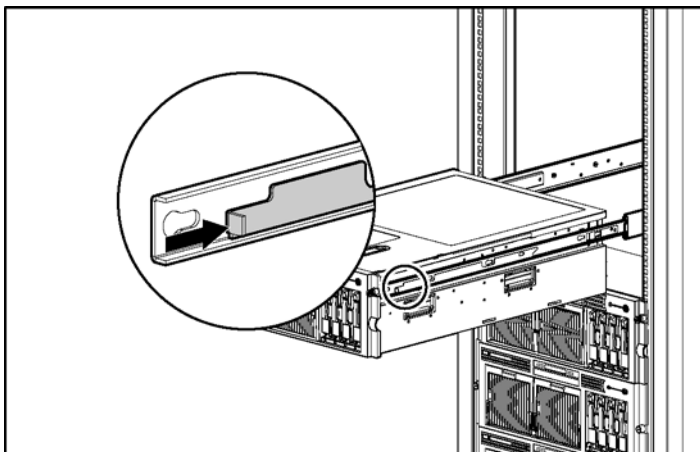


Figure 3-10: Sliding the server to the rear of the rack

16. Tighten the thumbscrews to secure the server to the rack.

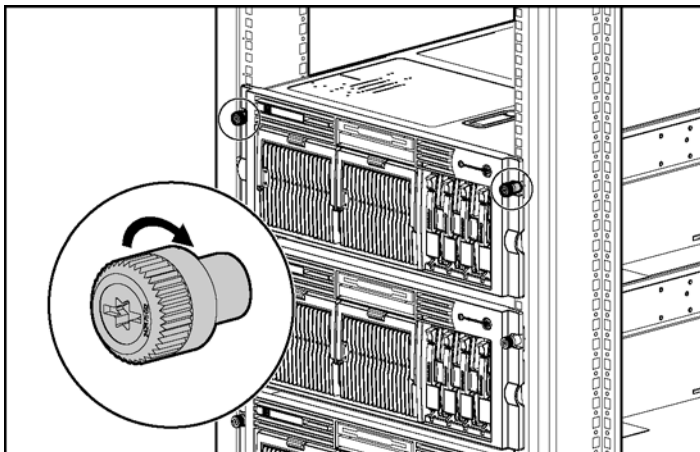


Figure 3-11: Tightening the thumbscrews

17. Reinstall the power supplies.

Connecting the power cord and peripheral devices



WARNING: To reduce the risk of electric shock or fire, do not plug telecommunications/telephone connectors into the NIC connectors.

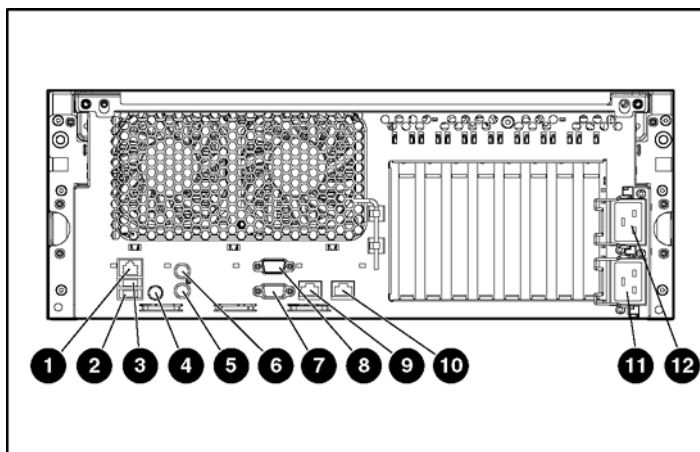


Figure 3-12: Rear panel components

Table 3-2: Rear panel components

Item	Description
1	iLO Manager connector
2	USB connector 1
3	USB connector 2
4	Rear unit identification button and LED
5	Keyboard connector
6	Mouse connector
7	Video connector
8	Serial connector
9	NIC 2
10	NIC 1
11	AC inlet 1(primary)
12	AC inlet 2 (optional)

Connecting the power cord



WARNING: To reduce the risk of electric shock or damage to the equipment:

- Do not disable the power cord grounding plug. The grounding plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.
- Do not route the power cord where it can be walked on or pinched by items placed against it. Pay particular attention to the plug, electrical outlet, and the point where the cord extends from the server.

1. Plug the power cord into the appropriate power supply AC power connector.

NOTE: The power connector for the primary power supply is inlet number one; the power connector for the redundant hot-plug power supply is inlet number two.

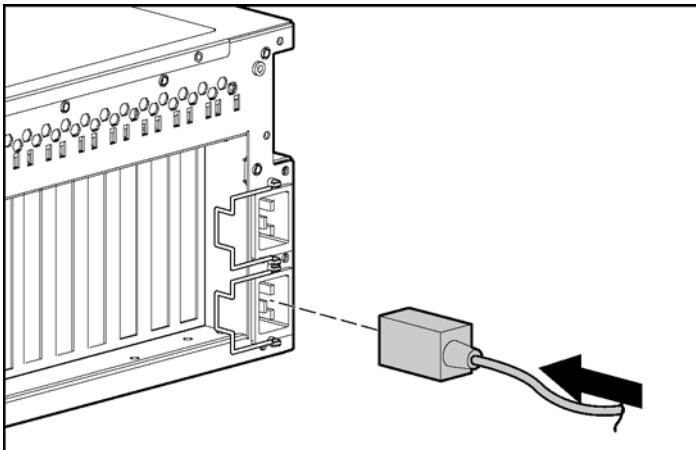


Figure 3-13: Connecting the power cord

2. Secure the power cord with the retaining clip.

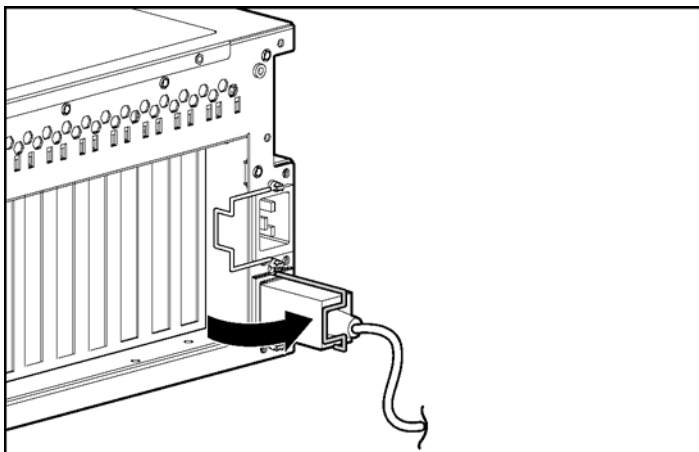


Figure 3-14: Securing the power cord

Attaching the cable management arm

The cable management arm ships with a round-hole bracket and a square-hole bracket. Use the appropriate bracket instructions for the server rack.

Attaching the cable management arm to a square-hole rack

1. Slide the bracket onto the rack.
2. Insert the bracket hooks into the square holes on the rack, and then push down to secure.
3. Tighten the thumbscrew to stabilize the cable management arm on the rack.

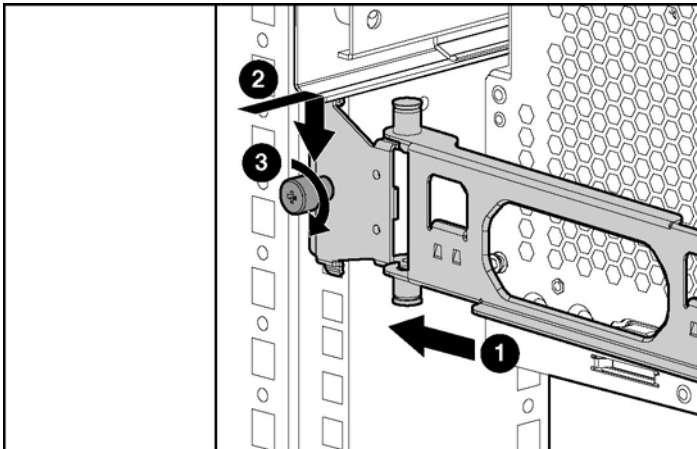


Figure 3-15: Securing the cable management arm to the square-hole rack

Attaching the cable management arm to a round-hole rack

1. Remove the square-hole bracket from the cable management arm by pulling out the spring-activated fasteners and then pulling out the bracket.

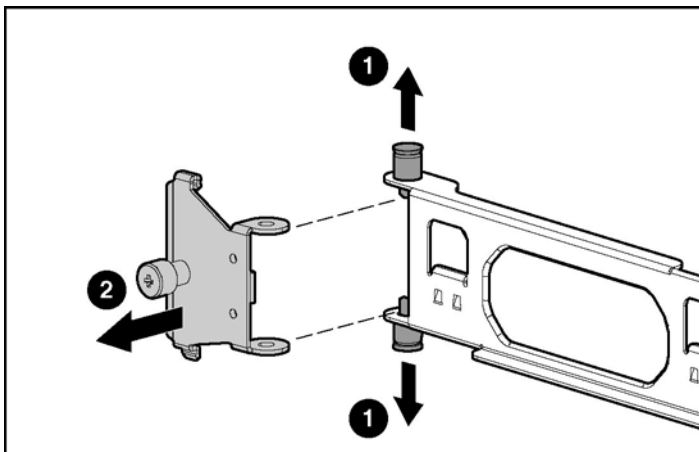


Figure 3-16: Removing the square-hole bracket

2. Attach the round-hole bracket by pulling out the spring-activated fasteners on the cable management arm, and then inserting the bracket in between them.

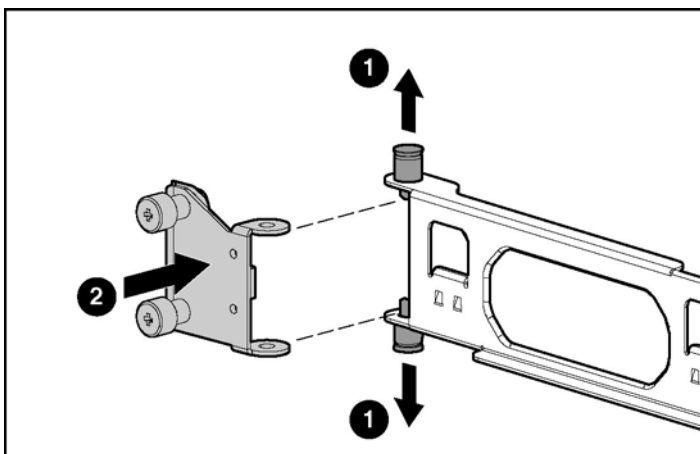


Figure 3-17: Attaching the round-hole bracket to the cable management arm

3. Slide the bracket onto the rack.

4. Attach the cable management arm to the round-hole rack, and then secure the thumbscrews.

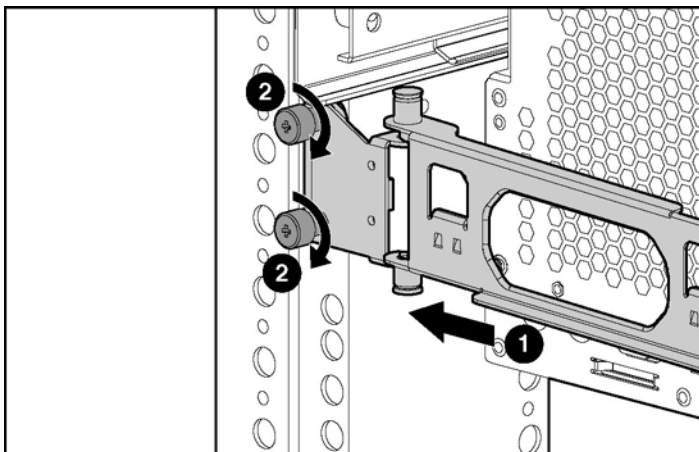


Figure 3-18: Attaching the cable management arm to the round-hole rack

Attaching the cable management arm to the server

1. Loosen the thumbscrews on the front of the server to enable the server to slide forward.
2. Align the keyholes on the cable management arm with the posts on the server, and then secure with the thumbscrew.

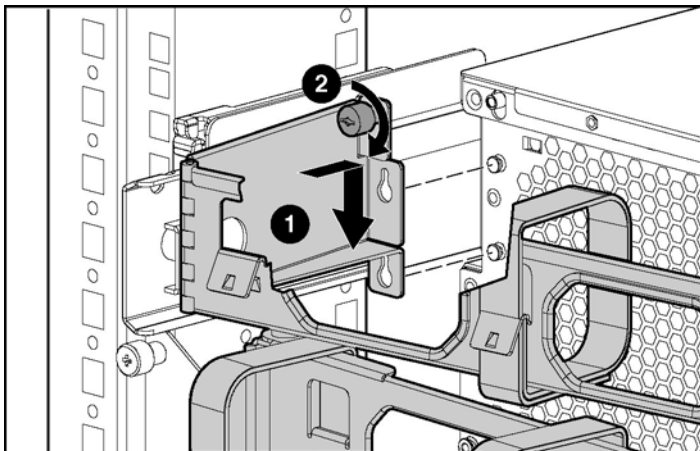


Figure 3-19: Attaching the cable management arm to the server

Securing the cables to the cable management arm

1. Align the pivot points of the cable management arm by sliding the server as needed.

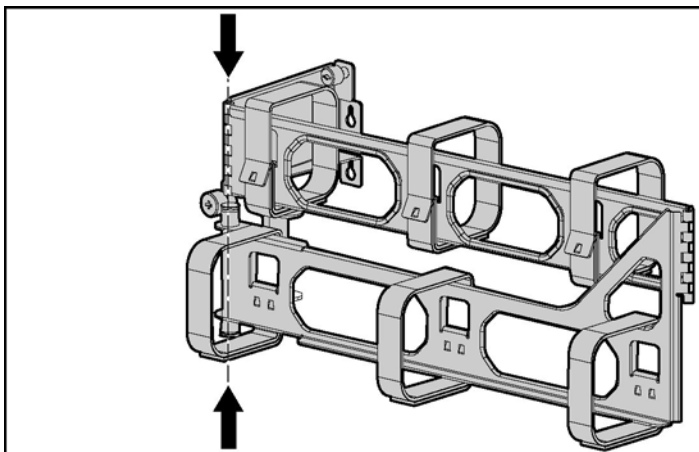


Figure 3-20: Aligning the cable management arm pivot points

2. Pivot the arm away from the server.

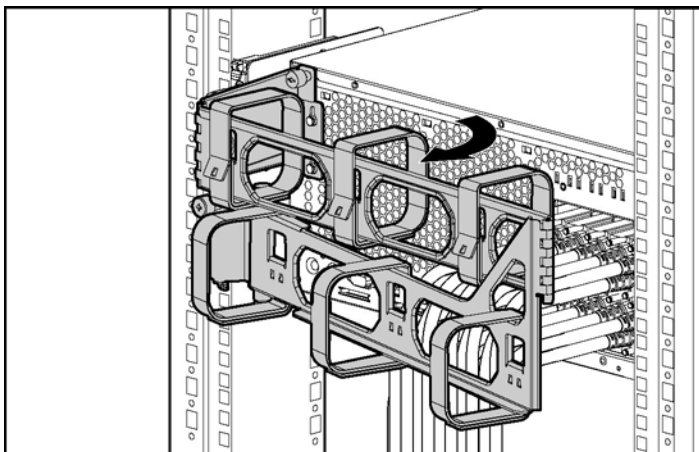


Figure 3-21: Pivoting the cable management arm

3. Secure the cables to the inside of the cable management arm using the Velcro straps.

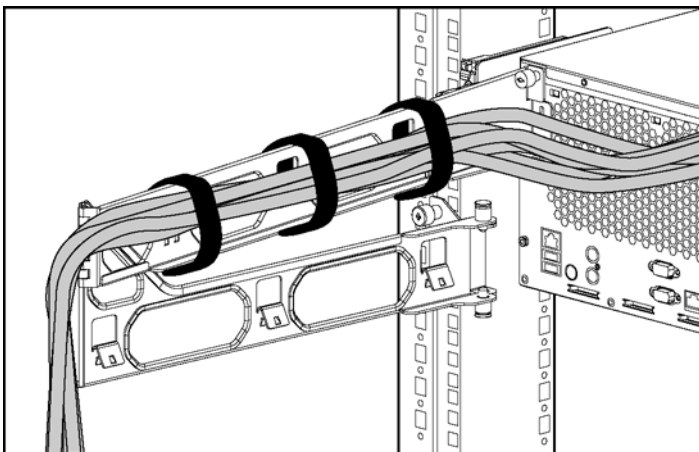


Figure 3-22: Securing cables to the cable management arm

4. Close the cable management arm, and finish securing the cables.

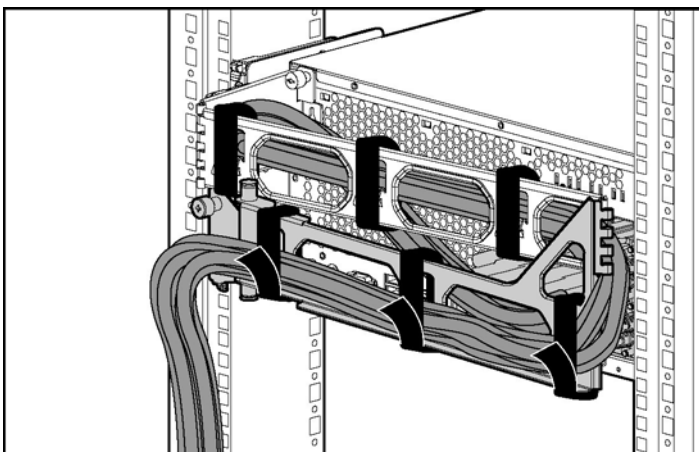


Figure 3-23: Closing the cable management arm

5. Secure the server to the rack.

Powering up and configuring the server

To power up the server, press the Power on/Standby button.

While the server boots, RBSU and the ORCA utility are automatically configured to prepare the server for operating system installation. To configure these utilities manually:

- Press the **F8** key when prompted during POST to configure the array controller using ORCA. The array controller defaults to RAID 0 with one drive installed and RAID 1 with more than one drive installed.
- Press the **F9** key when prompted during POST to change the server settings, such as the settings for language and operating system, using RBSU. The system is set up by default for the English language and a Microsoft® Windows® Server 2003 installation.

For more information about the automatic configuration, refer to the *HP ROM-Based Setup Utility User Guide* located on the Documentation CD.

Installing the operating system

To operate properly, the server must have a supported operating system. For the latest information on supported operating systems, refer to the HP website at <http://hp.com/go/supportos>.

Two methods are available to install an operating system on the server:

- SmartStart assisted installation—Insert the SmartStart CD into the CD-ROM drive, and reboot the server.

- Manual installation—Insert the operating system CD into the CD-ROM drive, and reboot the server. This process might require you to obtain additional drivers from the HP website at <http://www.hp.com/support>.

Follow the on-screen instructions to begin the installation process.

For information on using these installation paths, refer to the SmartStart installation poster in the *ProLiant Essentials Foundation Pack*, included with the server.

Registering the server

Register the server at the HP website, <http://register.hp.com>.

Routine maintenance

The *HP ProLiant DL585 Server Maintenance and Service Guide* provides specific information required for general maintenance and component replacement, including:

- Spare part numbers
- Removal and replacement procedures
- Diagnostic tools

The *HP ProLiant DL585 Server Maintenance and Service Guide* can be accessed through the Documentation CD or the product website at <http://www.hp.com/>.

Installing hardware options

If more than one option is being installed, read the installation instructions for all of the hardware options and identify similar steps to streamline the installation process.

The following warnings apply to all procedures:



WARNING: To reduce the risk of personal injury from surfaces, allow the drives and internal system components to cool before touching them.



CAUTION: To prevent damage to electrical components, properly ground the server before beginning any installation procedure. Improper grounding can cause electrostatic discharge.

Processor memory boards

The server supports up to four processor memory boards with AMD Opteron processors.



CAUTION: Processor memory boards 1 and 2 must always be installed. The system will not boot if either board is missing.



CAUTION: Update the ROM to be sure that the system ROM recognizes the new processor you are installing. For the most recent ROMPaq, refer to the HP website and follow the support link on the product website.

Failure to flash the ROM before installing processor memory boards can cause system failure.

IMPORTANT: Mixing processor speeds and cache sizes is not supported.

Processor memory board population guidelines

- All processors must be of the same speed and cache size.
- Processor memory boards 1 and 2 must always be installed.
- Processor memory boards 3 and 4 must be installed as a pair.

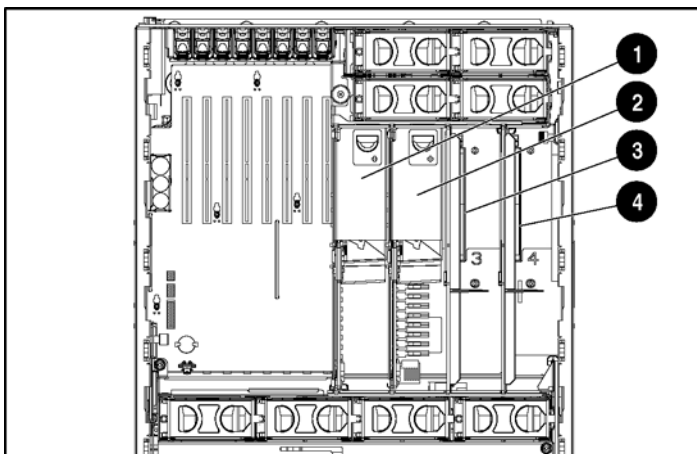


Figure 4-1: Locating the processor memory boards

Table 4-1: Processor memory boards

Item	Description
1	Processor memory board slot 1 (processor)
2	Processor memory board slot 2 (boot processor)
3	Processor memory board slot 3 (air baffle)
4	Processor memory board slot 4 (air baffle)

Installing a processor memory board

1. Power down the server. Refer to “Powering down the server” in Chapter 2, “Server operations.”
2. Extend the server from the rack. Refer to “Extending the server from the rack” in Chapter 2, “Server operations.”
3. Remove the access panel. Refer to “Removing the access panel” in Chapter 2, “Server operations.”
4. Remove the air baffle.

NOTE: Do not discard the air baffle. Store it for possible future use.

5. Install the new processor memory board.

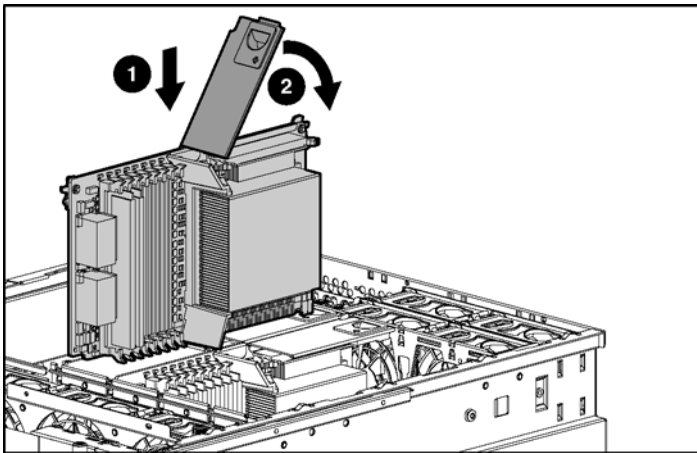


Figure 4-2: Installing a processor memory board

6. Reinstall the access panel.
7. Restore the server to its operating position in the rack.
8. Power up the server.

NOTE: The ROM sets the processing frequency during POST.

Upgrading processor memory boards

To upgrade to a single core 2.6 GHz processor or later or a dual core processor configuration:

1. Power down the server. Refer to “Powering down the server” in Chapter 2, “Server operations.”
2. Extend the server from the rack. Refer to “Extending the server from the rack” in Chapter 2, “Server operations.”
3. Remove the access panel. Refer to “Removing the access panel” in Chapter 2, “Server operations.”
4. Remove all the processor memory boards and air baffles.

NOTE: Do not discard the air baffle. Store it for possible future use.

5. Remove the front fan cage.

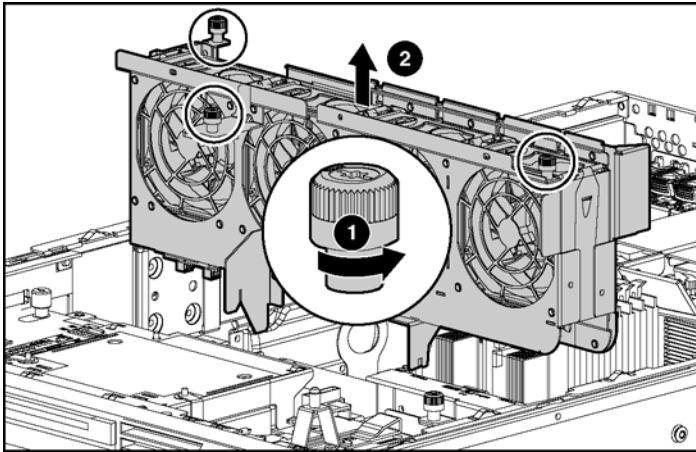


Figure 4-3: Removing the front cage

6. Reposition the BBWC cable by angling it toward the rear of the chassis.

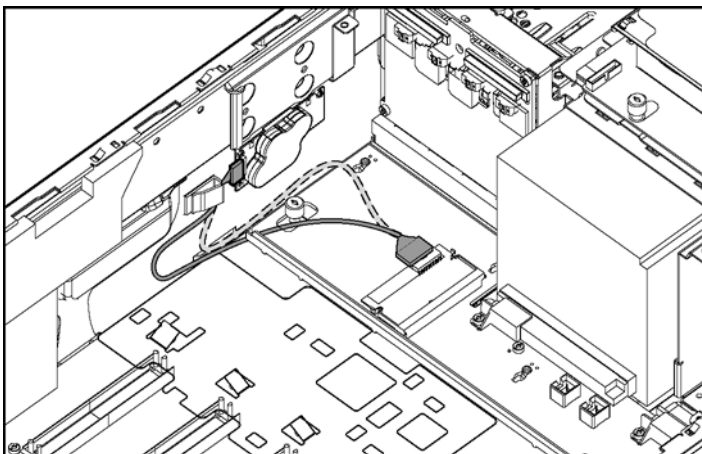


Figure 4-4: Repositioning the BBWC cable

7. Separate the Velcro from the front foam piece and adhere to the side wall of the chassis.

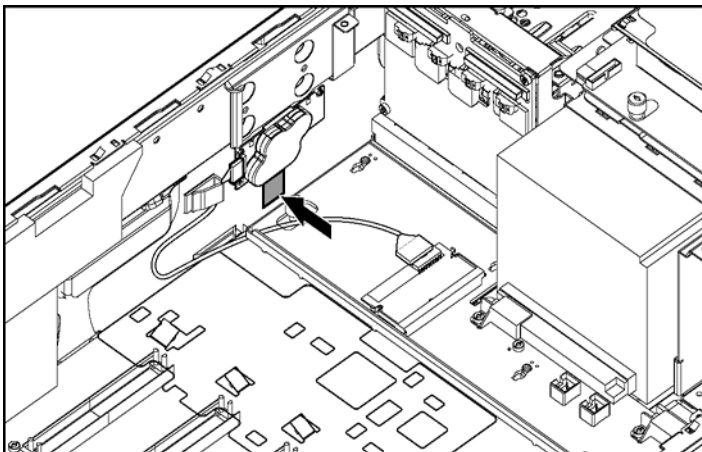


Figure 4-5: Adhering the Velcro to the side wall

8. Attach the front foam piece to the Velcro on the side wall of the chassis.

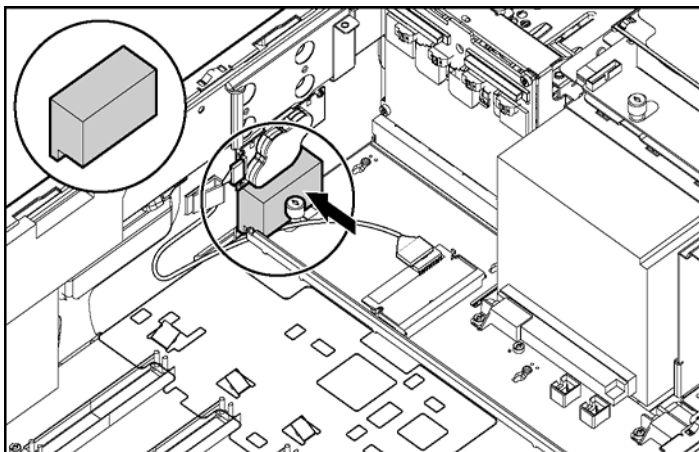


Figure 4-6: Attaching the front foam piece to the Velcro

9. Remove the rear fan cage.

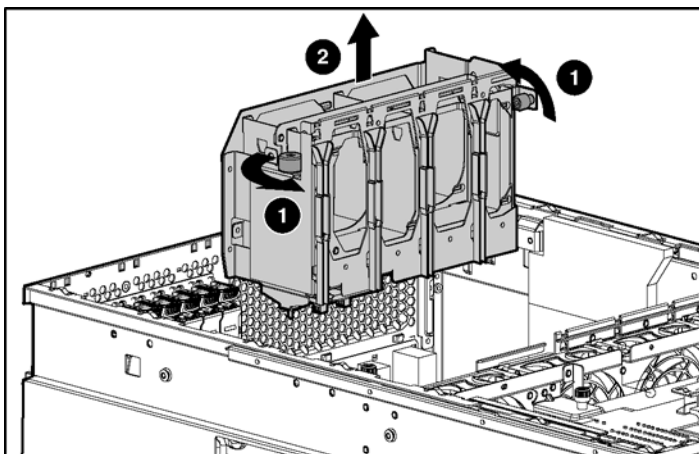


Figure 4-7: Removing the rear fan cage

10. Separate the Velcro from the rear foam piece, and adhere it to the side wall of the chassis.

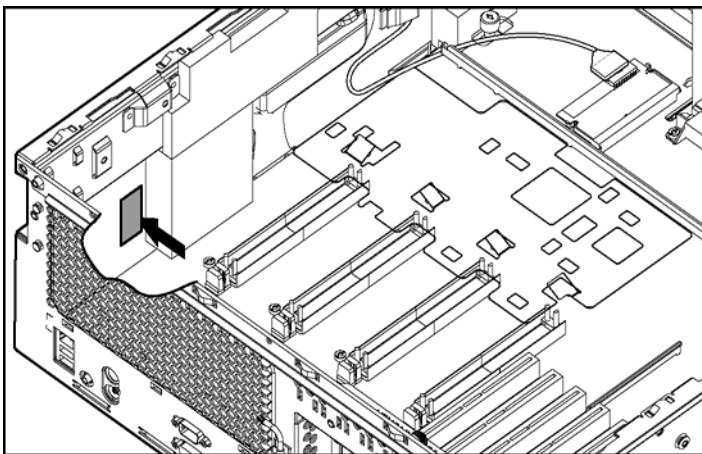


Figure 4-8: Adhering the Velcro to the side wall

11. Attach the rear foam piece to the Velcro on the side wall of the chassis.

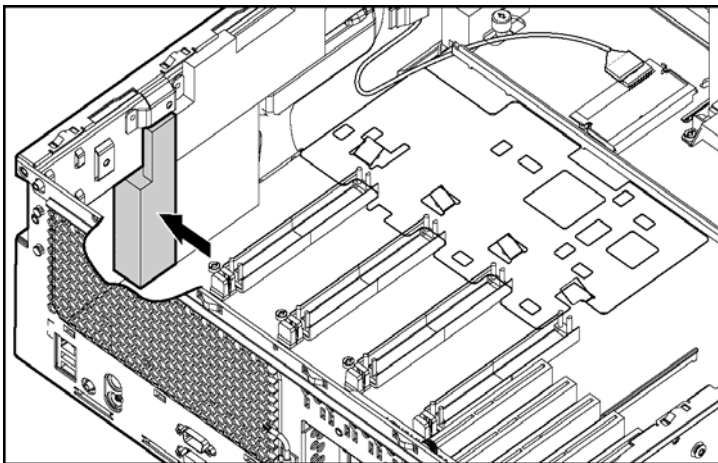


Figure 4-9: Attaching the rear foam piece to the Velcro

12. Reinstall the rear fan cage.
13. Reinstall the front fan cage.

14. Install the new processor memory boards.
15. Install the air baffles in any open processor memory board slots.
16. Reinstall the access panel.
17. Replace the server in the rack.
18. Power up the server.

Memory options

The server provides DDR SDRAM that can improve memory clock speed to:

- Up to 266 MHz with PC2100 DIMMs
- Up to 333 MHz with PC2700 DIMMs (2.4-GHz server models and above)
- Up to 400 MHz with PC3200 DIMMs (2.6-GHz server models and above)

NOTE: PC3200 DIMMs are only supported on processor memory boards with four DIMM slots.

It activates output on both the rising and falling edge of the system clock rather than on just the rising edge, potentially doubling output. The server features the following advanced memory technologies:

- Support for industry-standard registered ECC DDR SDRAM memory
 - Up to 64 GB at 266 MHz with PC2100 or PC2700 DIMMs
 - Up to 48 GB at 333 MHz with PC2700 DIMMs
 - Up to 32 GB at 400 MHz with PC3200 DIMMs
- Dual-channel memory architecture

Minimum memory requirements

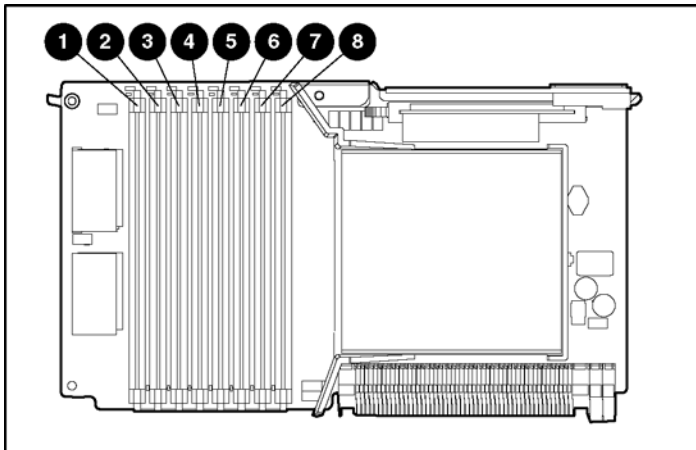
- Two DIMMs must be installed on the processor memory board in slot 2.
- All DIMMs on a processor memory board must have the same part number.

NOTE: Processor memory boards in slots 1, 3, and 4 can be installed without memory. However, this configuration might not result in optimal performance. Certain application programs run more efficiently if the DIMMs are balanced across all processor memory boards.

Memory population guidelines for processor memory boards with eight DIMM slots

- DIMMs on different processor memory boards can be of different sizes.
- DIMMs on the same processor memory board must be of the same size and have the same part number.
- DIMMs must be installed on a processor memory board in pairs and in bank order.
- DIMMs must populate three or fewer banks on a memory board with PC2700 DIMMs to maintain a memory clock speed of 333 MHz.

NOTE: If all four banks (eight DIMM slots) are populated with PC2700 DIMMs, the maximum memory clock speed will be 266 MHz.

**Figure 4-10: DIMM slots****Table 4-2: Processor memory board memory banks**

Slots	Bank
1-2	Bank 1
3-4	Bank 2
5-6	Bank 3
7-8	Bank 4

Memory population guidelines for processor memory boards with four DIMM slots

- DIMMs on different processor memory boards can be of different sizes.
- DIMMs on the same processor memory board must be of the same size and have the same part number.
- DIMMs must be installed on a processor memory board in pairs and in bank order.

NOTE: PC3200 DIMMs are only supported by processor memory boards with four DIMM slots.

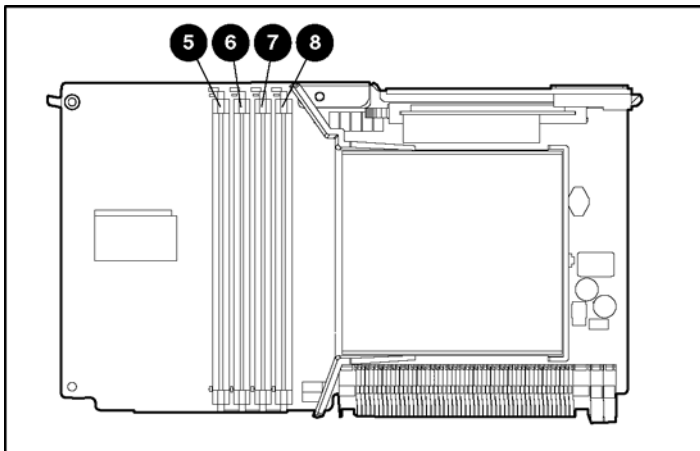


Figure 4-11: DIMM slots

Table 4-3: Processor memory board banks

Slots	Bank
5–6	Bank 1
7–8	Bank 2

Internal storage and media drives

The server ships standard with a diskette drive and an IDE CD-ROM drive in the universal media bays. You can replace the CD-ROM or diskette drive with a DVD drive, another diskette drive, or another CD-ROM drive.

Locating the internal storage and universal media drives

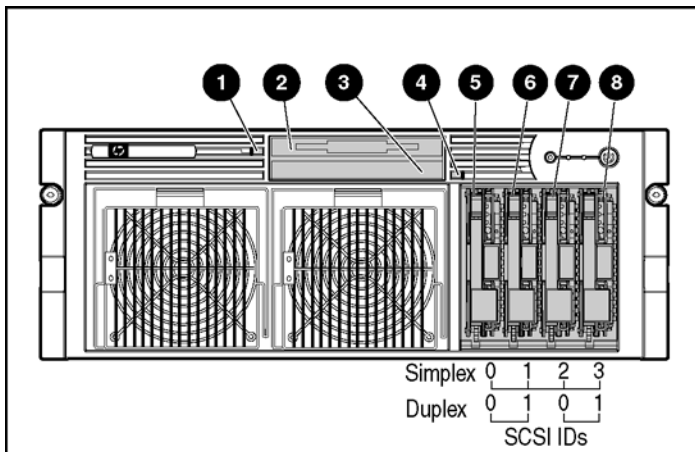


Figure 4-12: Internal storage and universal media drives

Table 4-4: Internal storage and universal media drives

Item	Description
1	Eject button for universal media bay 1
2	Universal media bay 1 (diskette drive)
3	Universal media bay 2 (CD-ROM drive)
4	Eject button for universal media bay 2
5-8	SCSI hot-plug hard drive bays 0 through 3

Hot-plug SCSI hard drive options

The server supports up to four hot-plug Ultra3 or Ultra320 drives. The embedded Smart Array 5i Plus controller is Ultra3-based technology. For the drives to operate at Ultra320 speeds, an optional PCI-X based Ultra320 SCSI controller must be installed. The server ships in duplex configuration, but the SCSI backplane can be configured for either simplex or duplex mode.

Installing a hot-plug SCSI hard drive

Installation of an optional hot-plug SCSI hard drive requires the following operations:

- Determining the proper hot-plug hard drive installation order
- Following the guidelines for installing SCSI devices
- Installing a hot-plug hard drive

Determining the proper hot-plug SCSI hard drive installation order

The system reads and manages the hot-plug SCSI hard drives based on the SCSI ID number assigned to each drive. For optimal hard drive management and performance, install the hard drives in the order of SCSI ID assignments. Always populate hard drive bays starting with the lowest SCSI ID.

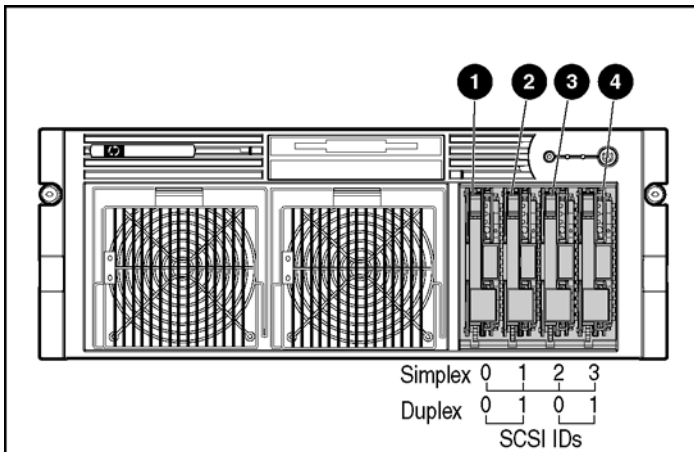


Figure 4-13: Hot-plug SCSI hard drives and SCSI ID numbers

Table 4-5: Hot-plug SCSI hard drives and SCSI ID numbers

Item	Description	Simplex SCSI ID	Duplex SCSI ID
1	SCSI hard drive 1	0	0
2	SCSI hard drive 2	1	1
3	SCSI hard drive 3	2	0
4	SCSI hard drive 4	3	1

Note: Simplex configuration equals all four drives in the server connected to one SCSI channel. Duplex configuration equals two drives per SCSI channel.

Guidelines for installing SCSI devices

The following guidelines apply for installing internal and external SCSI devices:

- Mixing other drive standards degrades the overall performance of the drive subsystem.
- Using drives with the same capacity provides the greatest storage space efficiency when the drives are grouped together into the same drive array.

Removing a drive blank

1. Squeeze the ejector levers.
2. Remove the blank.

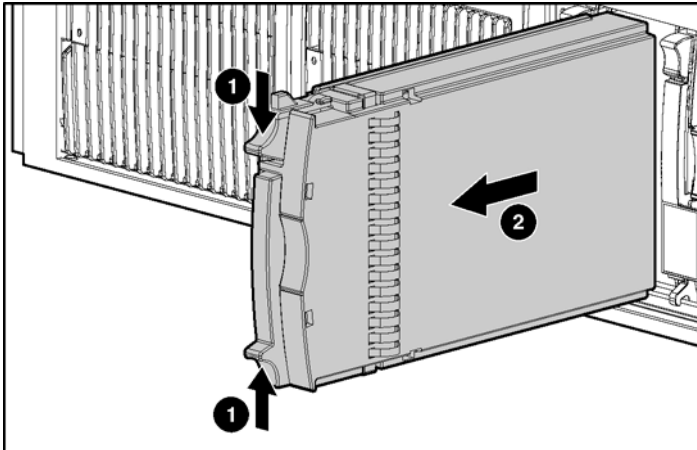


Figure 4-14: Removing a drive blank

Removing a hot-plug SCSI hard drive

1. Press the ejector lever release button.
2. Pull the ejector lever open.
3. Remove the hard drive.

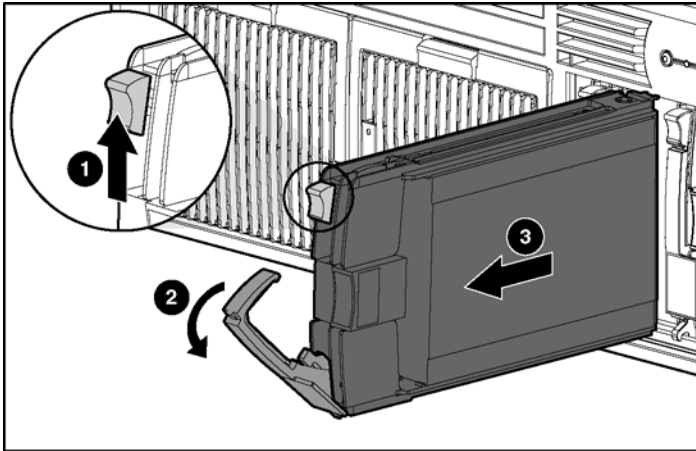


Figure 4-15: Removing a hot-plug SCSI hard drive

Installing a hot-plug SCSI hard drive

1. Press the ejector lever release button on the replacement hard drive to disengage the lever.
2. Insert the hot-plug SCSI hard drive into the drive cage. Be sure that the drive seats firmly into the connector on the SCSI backplane.
3. Close the ejector lever.

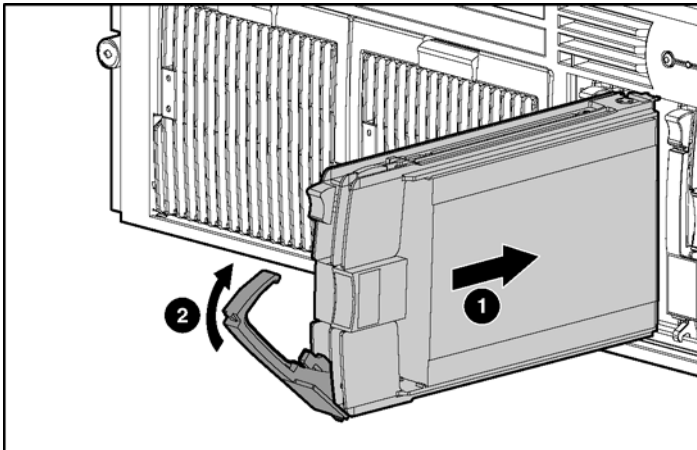


Figure 4-16: Installing a hot-plug SCSI hard drive

4. Be sure that the hot-plug hard drive activity LEDs on the front of the system are illuminated green, indicating that the system is functioning properly. For detailed information on LEDs, refer to Appendix E, "System LEDs and switches."
5. If any of the LEDs indicates an error, refer to Appendix H, "Troubleshooting," or refer to the *HP Servers Troubleshooting Guide* on the Documentation CD for instructions.

Switching from duplex to simplex mode

The server ships in duplex mode. To switch from duplex to simplex mode:

1. Power down the server. Refer to “Powering down the server” in Chapter 2, “Server operations.”
2. Extend the server from the rack. Refer to “Extending the server from the rack” in Chapter 2, “Server operations.”
3. Remove the access panel. Refer to “Removing the access panel” in Chapter 2, “Server operations.”
4. Locate the simplex/duplex switch.

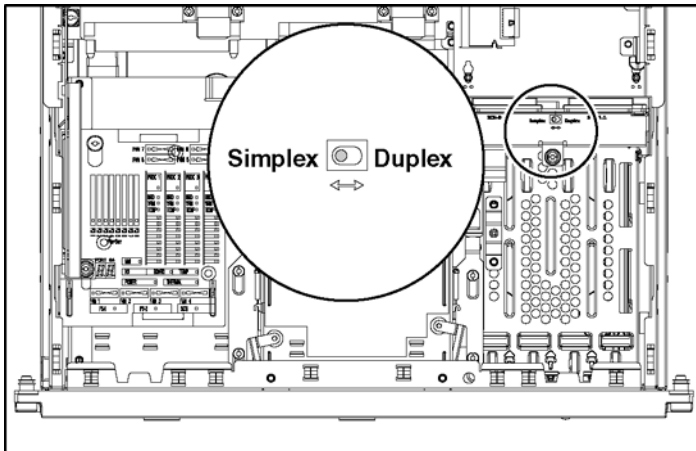


Figure 4-17: Locating the simplex/duplex switch

5. Move the switch from duplex to simplex.
6. Reinstall the access panel.
7. Restore the server to its operating position in the rack.
8. Power up the server.

Hot-plug SAS or SATA hard drive options

The server supports installation of eight hot-plug SAS (serial-attached SCSI) or SATA (serial ATA) hard drives. Before installing the SAS or SATA hard drives, you must first install a SAS hard drive cage.

Installing a hot-plug SAS or SATA hard drive

Installation of an optional hot-plug SAS or SATA hard drive requires the following operations:

- Installing the SAS hard drive cage
- Determining the proper hard drive installation order
- Installing the hot-plug SAS or SATA hard drive

Installing the SAS hard drive cage

NOTE: You must provide a SAS controller before proceeding with the SAS hard drive cage installation.

1. Power down the server. Refer to “Powering down the server” in Chapter 2, “Server operations.”
2. Remove all hard drives and hard drive blanks. Refer to the “Removing a hard drive blank” and “Removing a hot-plug SCSI hard drive” sections in this chapter.
3. Extend the server from the rack. Refer to “Extending the server from the rack” in Chapter 2, “Server operations.”
4. Remove the access panel. Refer to “Removing the access panel” in Chapter 2, “Server operations.”
5. Install the SAS or SATA controller. Refer to the directions provided with the controller for installation instructions.
6. Disconnect all cables from the SCSI backplane, if applicable.

7. Loosen the thumbscrew, and remove the SCSI backplane.

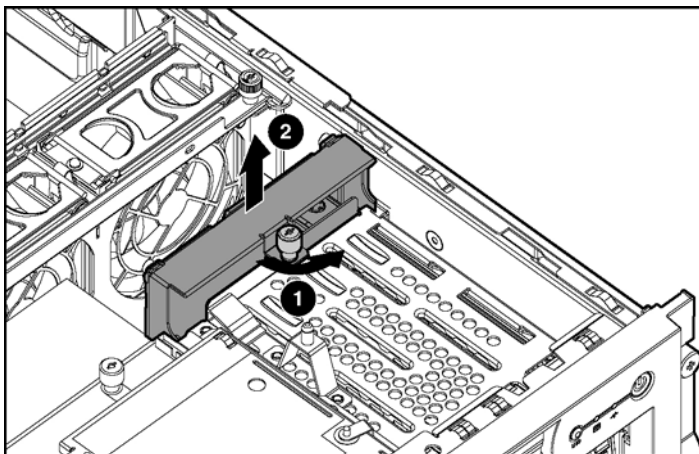


Figure 4-18: Removing the SCSI backplane

8. Install the power transfer board, and tighten the thumbscrew.

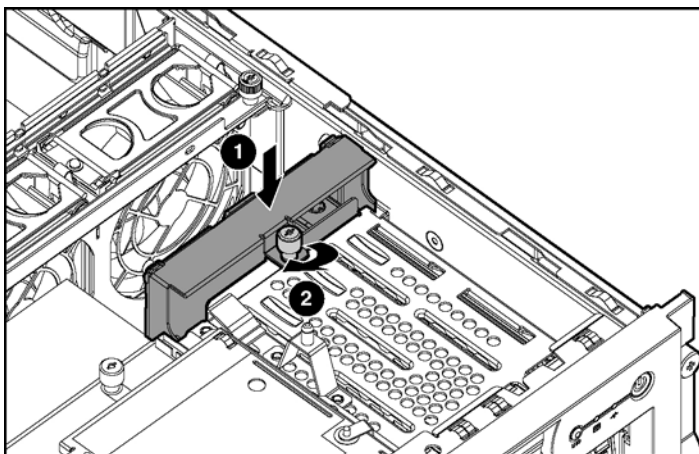


Figure 4-19: Installing the power transfer board

9. Route and connect the power cable to the connector on the power transfer board.

10. Route the SAS cables through the opening in the power transfer board and over the center wall.

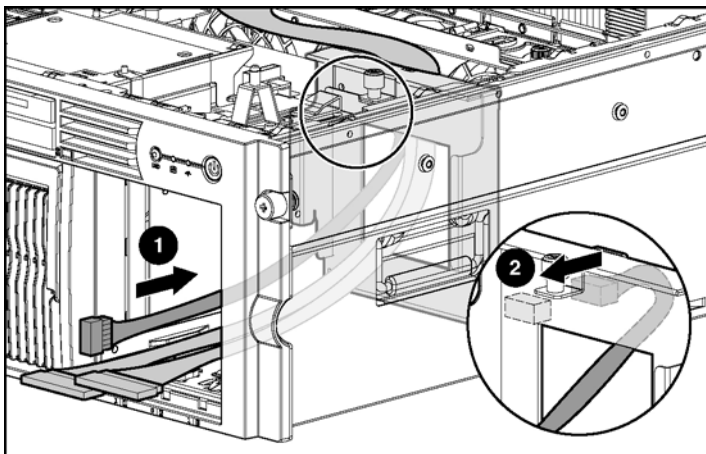


Figure 4-20: Connecting the SAS power cable



CAUTION: When routing cables, always be sure that the cables are not in a position where they can be pinched or crimped.

11. Connect the cables to the connectors on the back of the SAS hard drive cage.

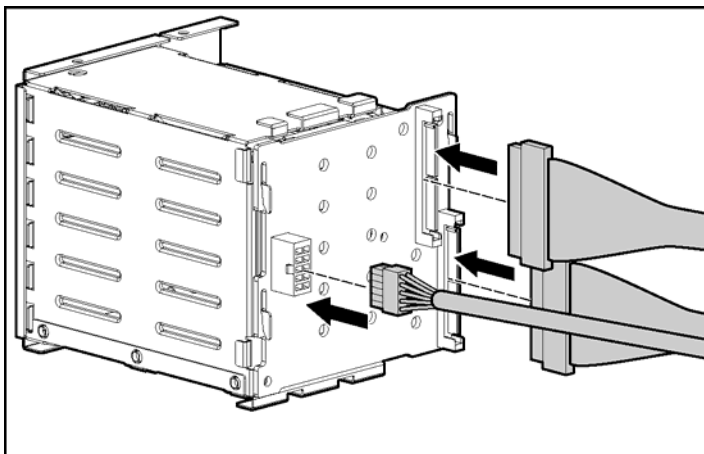


Figure 4-21: Connecting the cables to the SAS hard drive cage

12. Install the SAS hard drive cage, pulling the slack in the SAS cables over the center wall.

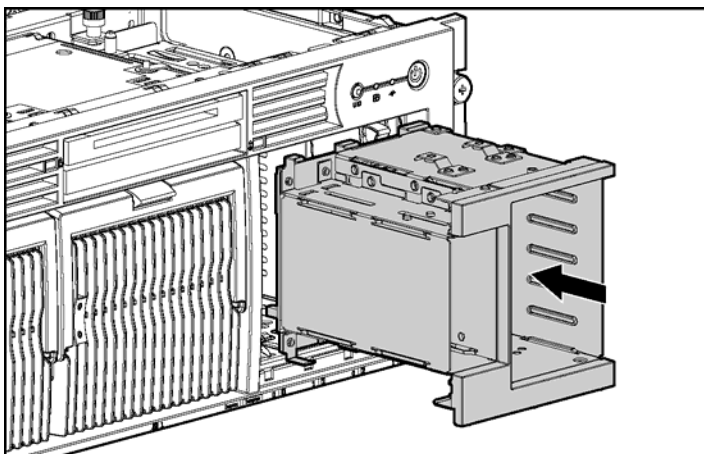


Figure 4-22: Installing the SAS hard drive cage

13. Connect the SAS cables to the SAS controller.

14. Secure the SAS hard drive cage with the screws provided in the option kit.

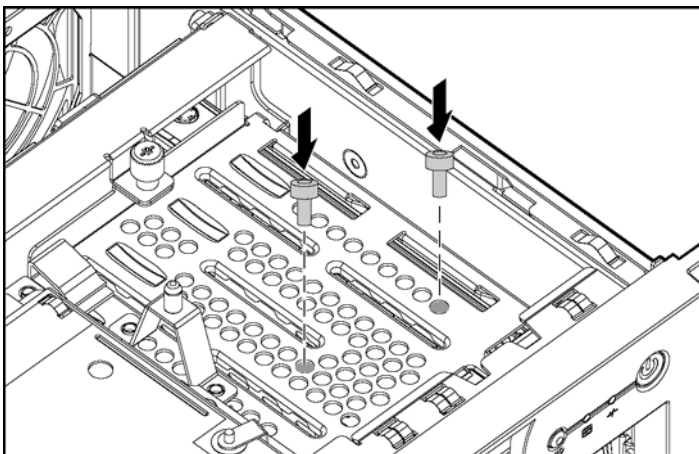


Figure 4-23: Installing the screws into the SAS hard drive cage

15. Replace the access panel.
16. Install the hot-plug hard drives or hard drive blanks into the SAS hard drive cage.



CAUTION: To prevent improper cooling and thermal damage, do not operate the server unless all bays are populated with either a component or a blank.

Hot-plug SAS or SATA hard drive guidelines

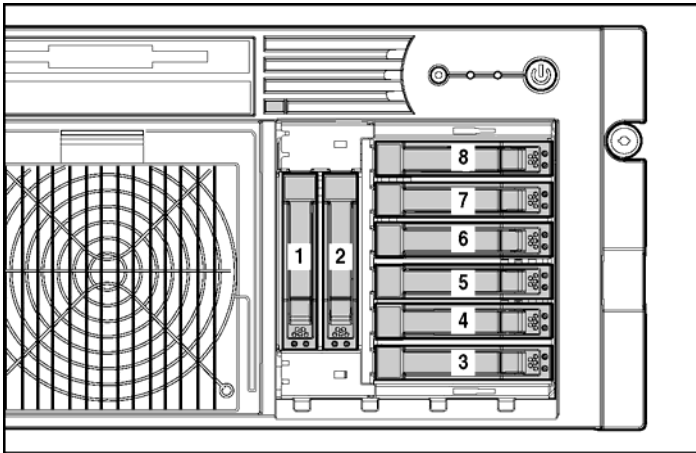


Figure 4-24: Hot-plug SAS or SATA hard drive ID numbers

When adding SAS hard drives to the server, observe the following general guidelines:

- The server supports eight SAS or SATA hot-plug hard drives.
- The system automatically sets all drive numbers.
- If only one hard drive is used, install it in the bay with the lowest number.
- Hard drives must be SFF types.
- Drives must be the same capacity to provide the greatest storage space efficiency when drives are grouped together into the same drive array.

Installing a hot-plug SAS or SATA hard drive

1. Prepare the hard drive.

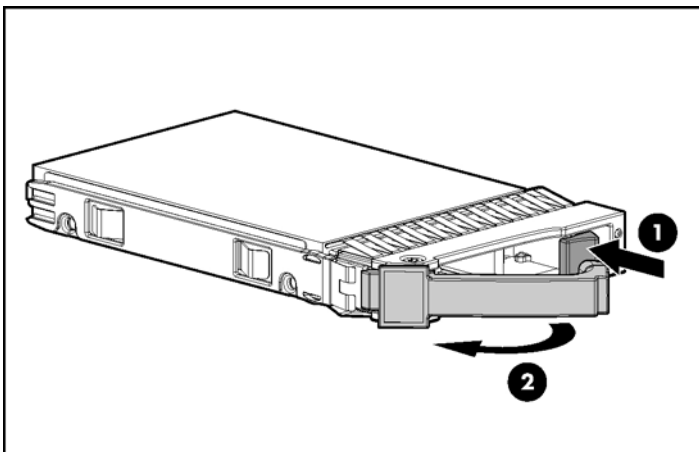


Figure 4-25: Preparing the SAS or SATA hard drive for installation

2. Insert the hot-plug SAS or SATA hard drive into the drive cage. Be sure that the drive seats firmly into the connector in the back of the drive cage.

3. Close the ejector lever.

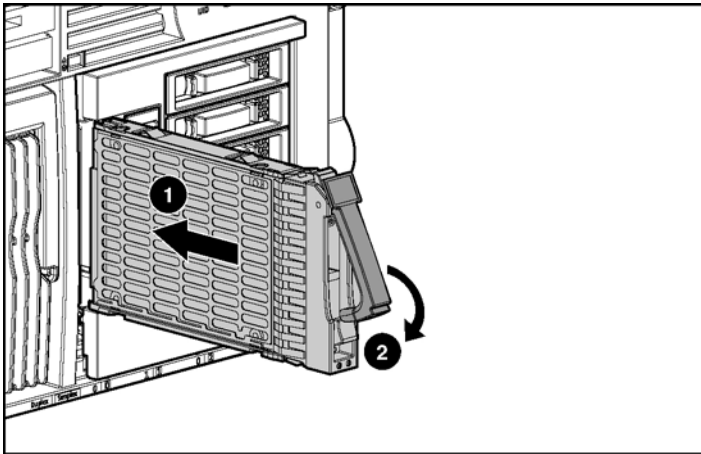


Figure 4-26: Installing a hot-plug SAS or SATA hard drive

4. Be sure that the hot-plug hard drive activity LEDs on the front of the system are illuminated, indicating that the system is functioning properly. For detailed information on LEDs, refer to Appendix E, “System LEDs and switches.”

If any of the LEDs indicates an error, refer to Appendix H, “Troubleshooting,” or refer to the *HP Servers Troubleshooting Guide* on the Documentation CD for instructions.

Universal media bays

The server supports installation of removable universal media drives into the universal media bays. Drives supported include:

- CD-ROM (standard)
- Diskette (standard)
- DVD (optional)

IMPORTANT: For the diskette drive to be bootable, it must be installed in the top universal media bay (1). For the CD-ROM or DVD drive to be bootable, it must be installed in the bottom universal media bay (2).

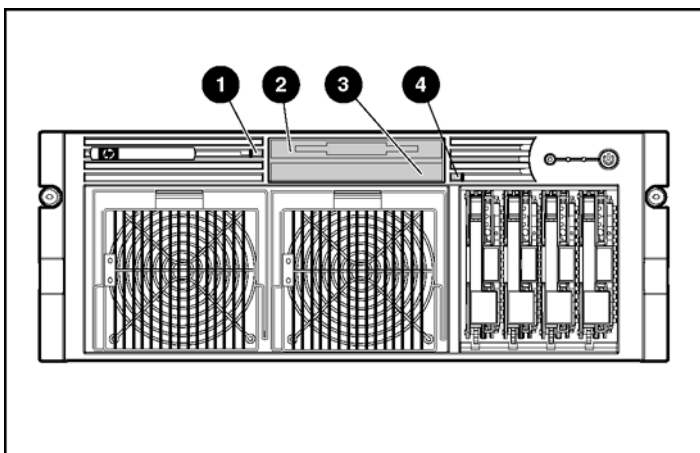


Figure 4-27: Locating the universal media bays

Table 4-6: Universal media bays

Item	Description
1	Eject button for universal media bay 1
2	Universal media bay 1 (diskette drive)
3	Universal media bay 2 (CD-ROM drive)
4	Eject button for universal media bay 2

Removing a universal media drive

1. Power down the server. Refer to “Powering down the server” in Chapter 2, “Server operations.”
2. Use the Torx T-15 tool to press the appropriate ejection button, and pull the universal media drive out of the universal media bay. Refer to “Locating and removing the Torx T-15 tool” in Chapter 2, “Server operations.”

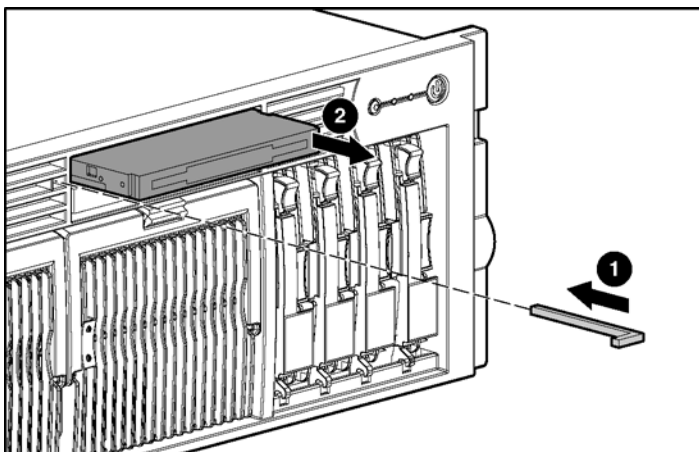


Figure 4-28: Removing a drive from bay 1

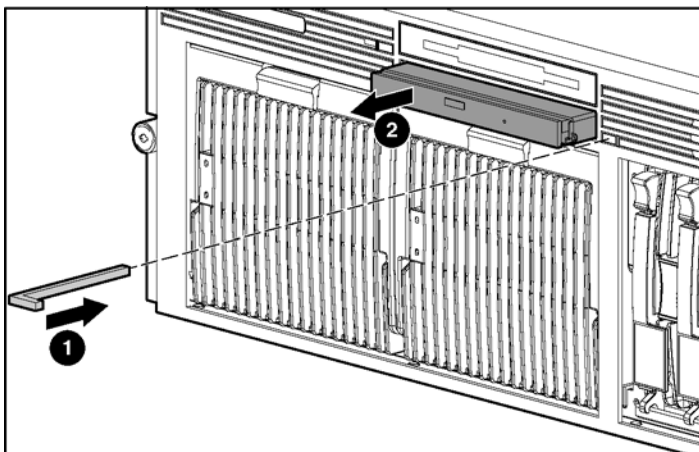


Figure 4-29: Removing a drive from bay 2

Installing a universal media drive

1. Power down the server. Refer to “Powering down the server” in Chapter 2, “Server operations.”
2. Remove the existing universal media drive. Refer to the “Removing a universal media drive” section in this chapter.
3. Insert the desired universal media drive into the universal media bay until it seats.

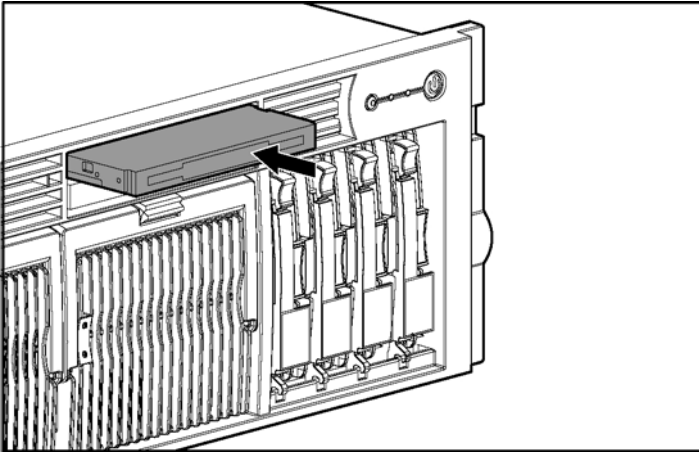


Figure 4-30: Installing a universal media drive

Hot-plug fans

The server supports redundant hot-plug fans in an N+1 configuration.

Locating hot-plug fans

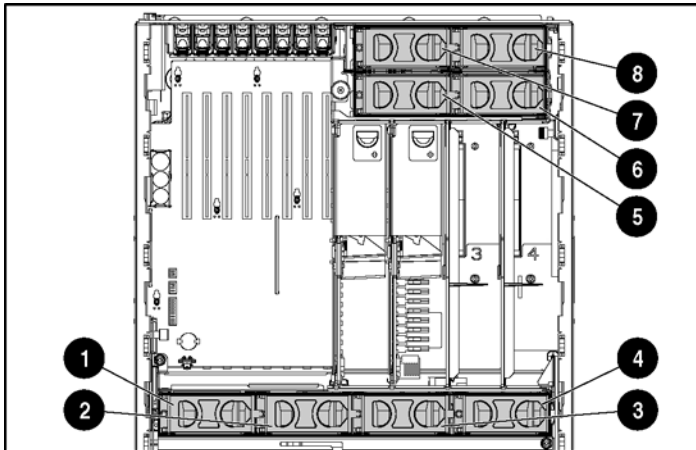


Figure 4-31: Hot-plug fans

Table 4-7: Hot-plug fans

Item	Description	Item	Description
1	Fan 1	5	Fan 5
2	Fan 2	6	Fan 6
3	Fan 3	7	Fan 7
4	Fan 4	8	Fan 8

Replacing a hot-plug fan

1. Extend the server from the rack. Refer to “Extending the server from the rack” in Chapter 2, “Server operations.”
2. Remove access panel. Refer to “Removing the access panel” in Chapter 2, “Server operations.”
3. Identify the nonfunctioning fan by locating an amber LED on the QuickFind diagnostic display or at the top of failed fan.
4. Remove the nonfunctioning fan.

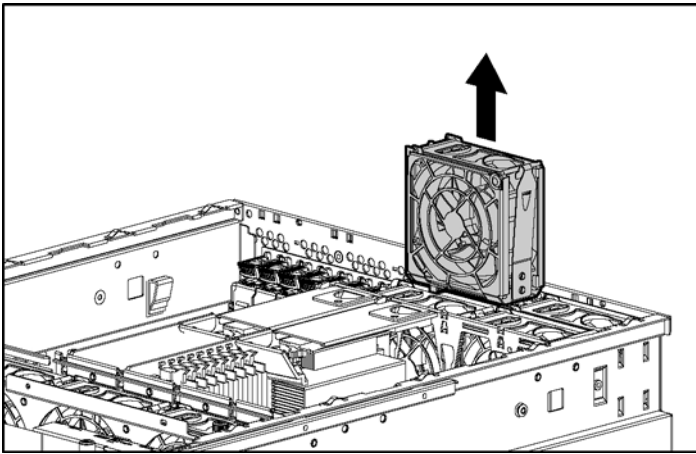


Figure 4-32: Removing a hot-plug fan

5. Install the replacement fan.

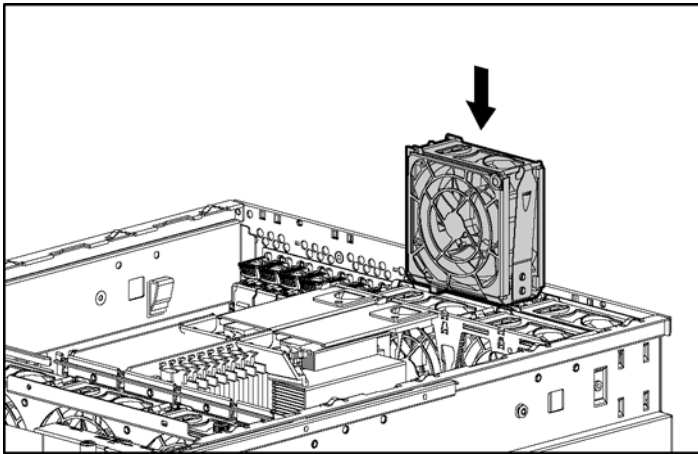


Figure 4-33: Installing a hot-plug fan

6. Be sure that the LED on the fan is green.
7. Reinstall the access panel.
8. Restore the server to its operating position in the rack.

Hot-plug power supplies

IMPORTANT: Do not install the power supplies until after the server is installed in the rack. Leaving the power supplies out reduces the weight of the server for purposes of rack installation.

The server supports a second hot-plug power supply to provide redundant power to the system in the event of a failure of the primary power supply. You can install or replace a second hot-plug power supply without powering down the server.

Locating the power supplies

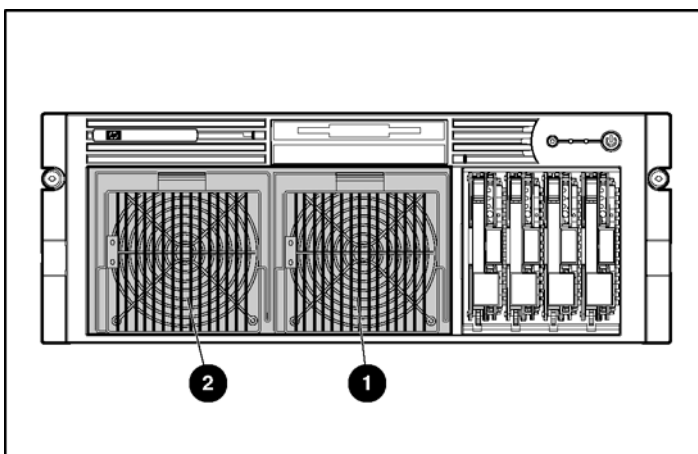


Figure 4-34: Locating the power supplies

Table 4-8: Power supplies

Item	Description
1	Hot-plug power supply 1 (primary)
2	Hot-plug power supply 2 (optional)

Removing a redundant hot-plug power supply or blank

1. If present, remove the Torx T-15 shipping screw from the bottom of the server with the Torx T-15 tool that is located on the back of the server.
2. Press the release button on the locking lever upward.
3. Pull down on the locking lever.
4. Remove the power supply or blank from the bay.

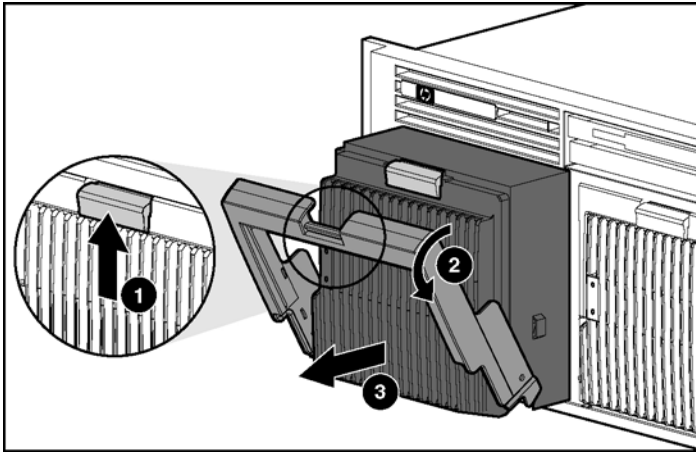


Figure 4-35: Removing a power supply or blank

Installing a redundant hot-plug power supply

1. Remove the protective cover from the connector pins on the new redundant power supply, if present.
2. Open the lever by pushing the lever release button upward.
3. Slide the power supply into the empty bay until it locks into place.
4. Close the locking lever.

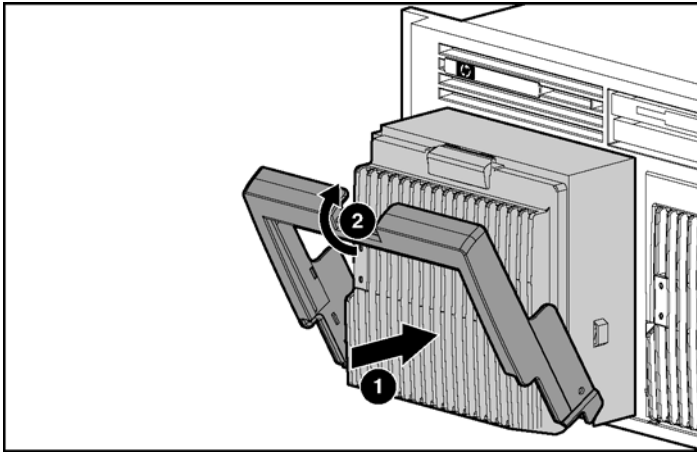


Figure 4-36: Installing a redundant hot-plug power supply

5. For shipment or for optional added security, install the retaining screw, which ships in a plastic bag with the power supply option kit. The pre-drilled hole for the screw is located on the bottom of the server.

6. Connect the power cord to AC inlet 2.

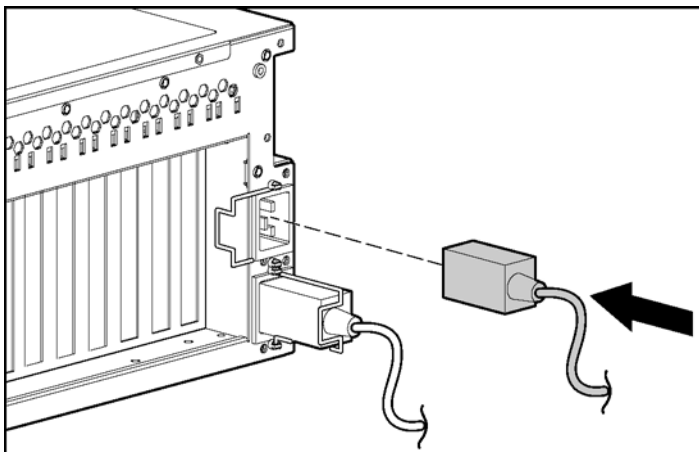


Figure 4-37: Connecting the power cord to AC inlet 2

7. Secure the power cord with the retaining clip.

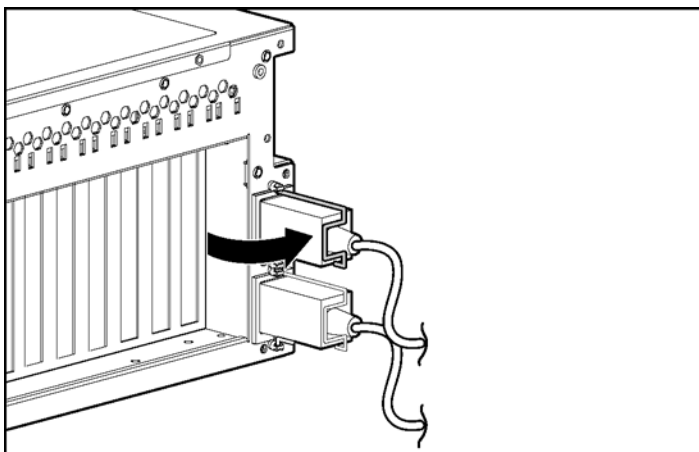


Figure 4-38: Securing the power cord

8. Be sure that the power LEDs on the power supply are green.

PCI-X expansion boards

The server supports the installation of both PCI and PCI-X expansion boards.

- PCI 33-MHz and 66-MHz
- PCI-X 66-MHz, 100-MHz, and 133-MHz

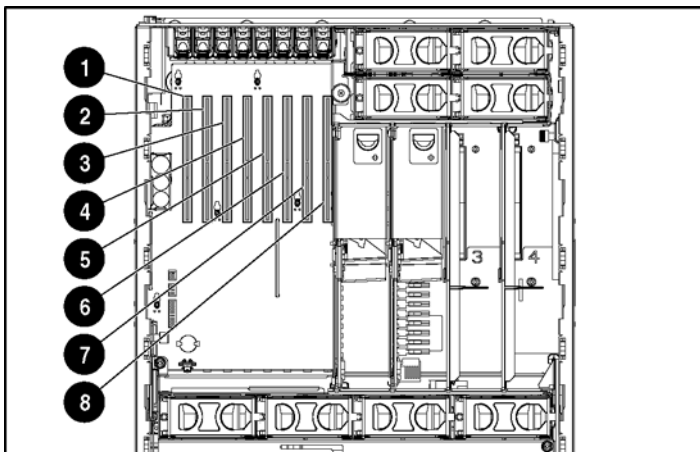


Figure 4-39: PCI-X expansion slots and buses

Table 4-9: PCI-X expansion slots and buses

Item	Slot	Bus	Description
1	Slot 1	Fifth bus	133-MHz
2	Slot 2	Sixth bus	133-MHz
3	Slot 3	Seventh bus	100-MHz
4	Slot 4	Seventh bus	100-MHz

continued

Table 4-9: PCI-X expansion slots and buses *continued*

Item	Slot	Bus	Description
5	Slot 5	Eighth bus	100-MHz
6	Slot 6	Eighth bus	100-MHz
7	Slot 7	Third bus	100-MHz
8	Slot 8	Third bus	100-MHz
Note: All PCI-X slots are 64-bit, 3.3-V keyed.			

Performance balancing

Balancing is the paired arrangement of expansion boards for optimal performance based on the bus architecture of the expansion slots. Properly balancing the boards across buses can improve performance. To balance expansion boards:

- Populate slots 1 and 2 with 133-MHz PCI-X boards.
- Populate slots 3 through 8 with 100-MHz PCI-X boards.
- Populate slots across different buses before populating two slots on the same bus.

For more information about PCI-X bus architecture and numbering, refer to the white paper, *PCI Bus Numbering in a Windows NT Environment*, on the HP website at <http://www.hp.com>.

Installing an expansion board



CAUTION: To avoid risk of damage to the system or expansion boards, remove all AC power cords before installing or removing non-hot-plug expansion boards. With the front panel Power On/Standby button in the standby position, auxiliary power is still connected to the expansion slots and can damage the board.

1. Power down the server. Refer to “Powering down the server” in Chapter 2, “Server operations.”
2. Extend the server from the rack. Refer to “Extending the server from the rack” in Chapter 2, “Server operations.”
3. Remove the access panel. Refer to “Removing the access panel” in Chapter 2, “Server operations.”
4. Press down on the expansion slot latch to release it.
5. Open the latch.
6. Remove the expansion slot cover.

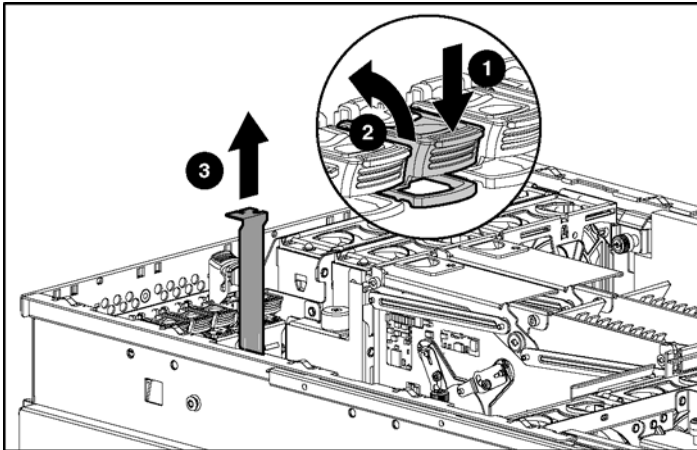


Figure 4-40: Releasing the expansion slot latch and removing the expansion slot cover

7. If you are installing a full-length board, press the PCI-X retaining clip toward the front of the server to lock it in the open position.

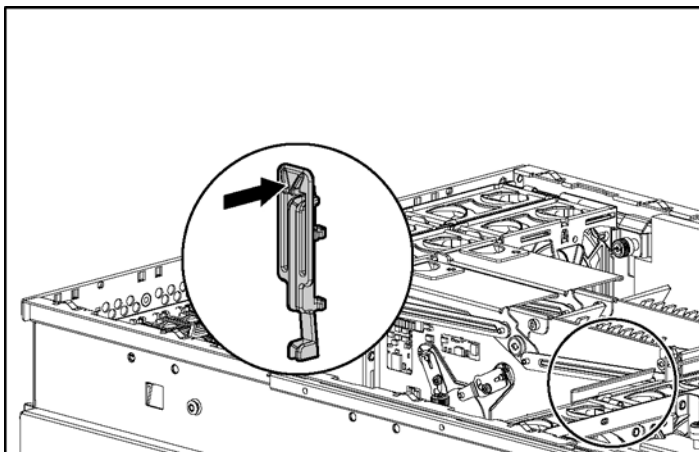


Figure 4-41: Locking the PCI-X retaining clip open

8. Install the expansion board in the slot, and apply even pressure to seat the board securely.
9. Close the expansion slot latch

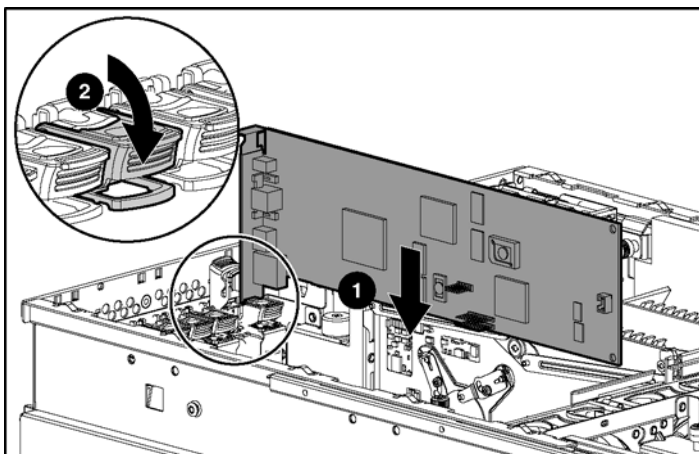


Figure 4-42: Installing a PCI-X expansion board

10. Close the PCI-X retaining clip (for full-length expansion boards only).

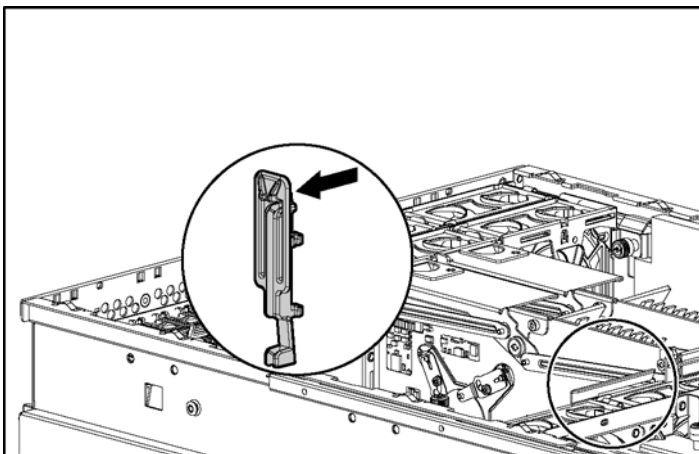


Figure 4-43: Securing the PCI-X retaining clip

11. Connect any required cables to the expansion board.
12. Reinstall the access panel.
13. Restore the server to its operating position in the rack.
14. Power up the server.

BBWCE

Features of the BBWCE include:

- Protects against hard boot, power, controller, or system board failures
- Provides up to 64 MB write cache memory protection (cache memory located on the 5i Plus Memory Module)
- Fully transportable to another HP ProLiant DL585 Server in the data center

NOTE: To easily transport protected cache data to another ProLiant DL585 server, remove the BBWCE and the 5i Plus Memory Module simultaneously. The BBWCE and 5i Plus Memory Module are connected to each other using a short cable.

- Battery charge up to 72 hours
- Battery life up to three years

The NiMH batteries in the battery module are continuously recharged through a trickle charging process whenever the system power is on. Under normal operating conditions, the battery module lasts three years before replacement is necessary.

Installing the BBWCE

1. Power down the server. Refer to “Powering down the server” in Chapter 2, “Server operations.”
2. Extend the server from the rack. Refer to “Extending the server from the rack” in Chapter 2, “Server operations.”
3. Remove the access panel. Refer to “Removing the access panel” in Chapter 2, “Server operations.”
4. Remove all PCI-X cables and any cards that might be installed.
5. Remove all processor memory boards. Refer to the “Processor memory boards” section in this chapter.
6. Remove the front fan cage.

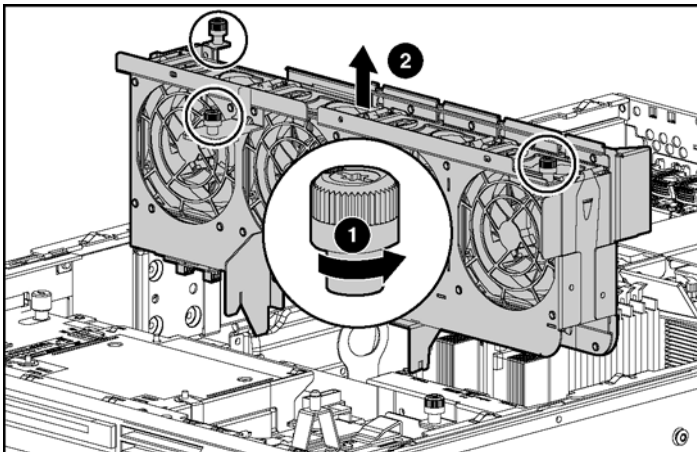


Figure 4-44: Removing the front fan cage

7. Align the BBWCE with the four stand-offs along the inside wall of the chassis, and press the enabler onto the stand-offs until it is securely seated.

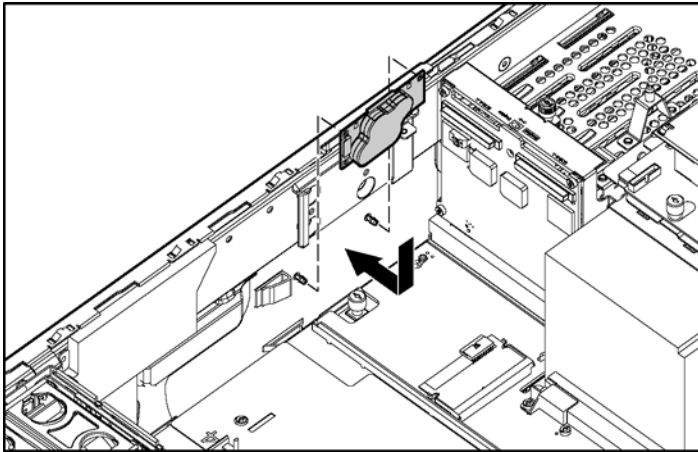


Figure 4-45: Installing the BBWCE

8. Connect the cable to the BBWCE and the 5i Plus Memory Module.

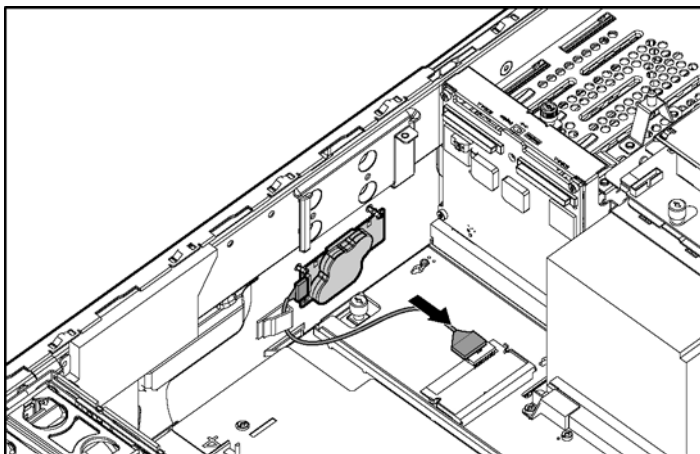


Figure 4-46: Connecting the cable to the BBWCE

9. Reverse steps 1 through 8 to restore the server.

After the BBWCE is installed, it takes up to 24 hours to completely charge the battery.

Server Configuration and Utilities

This chapter provides information about the following utilities and support tools:

- ROM-Based Setup Utility
- Enhanced auto-configuration process
- Integrated Lights-Out technology
- iLO ROM-Based Setup Utility
- Redundant ROM support
- ROMPaq utility
- System Online ROM flash component utility
- ROM legacy USB support
- ProLiant Essentials Foundation Pack
- SmartStart Scripting Toolkit
- HP Systems Insight Manager (HP SIM)
- HP Insight Diagnostics utility
- Automatic Server Recovery (ASR)
- Integrated Management Log (IML)

ROM-Based Setup Utility

RBSU is a configuration utility that is embedded in the server ROM. RBSU helps you configure certain server hardware settings and prepare the server for operating system installation without using diskettes. RBSU enables you to view and establish server configuration settings during initial system startup, as well as modify them after the server has been configured.

RBSU performs a wide range of configuration activities including:

- Configuring system devices and installed options
- Viewing system information
- Selecting the operating system
- Selecting the primary boot controller
- Managing storage options

In addition, RBSU includes other features, which are outlined in the “Using RBSU” section in this chapter.

Navigating RBSU

To navigate RBSU, use the following keys:

- To access RBSU, press the **F9** key when prompted during POST.
- To navigate the menu system, use the arrow keys.
- To make selections, press the **Enter** key.
- To exit RBSU, press the **F10** key.
- To return to the previous menu, press the **Esc** key.

Saving RBSU configuration settings

RBSU automatically saves settings when you press the **Enter** key. The utility does not prompt you for confirmation of settings before you exit the utility. To change a selected setting, you must select a different setting and press the **Enter** key.

Using RBSU

RBSU does not run automatically. The first time you power up the server, the system defaults to Windows Server 2003 and waits so you can select a different operating system by using RBSU. Press the **F9** key when prompted during POST to enter RBSU. While you are in RBSU, press any key to return to the RBSU main menu or press the **F10** key to exit RBSU.

NOTE: Most of the features in RBSU are not required in the setup of the server. The options in this utility are designed to assist with specific server configuration issues.

RBSU is divided into a series of menu selections designed to configure specific areas of the system. The primary menus are as follows:

- System options
- PCI-X devices
- Standard boot order (IPL)
- Date and time
- Server passwords
- Automatic Server Recovery
- Server asset tags
- Advanced options
- Utility language

For a complete explanation of RBSU features and functions, refer to the *ROM-Based Setup Utility User Guide* on the Documentation CD.

System options

The System Options menu is for overall system configuration settings. The following selections are included in this menu:

- **OS Selection**—Prompts you to select the operating system. This option automatically selects appropriate advanced settings for the selected operating system and must be set before the operating system installation.
- **Embedded COM Port A**—Enables you to either enable the embedded COM port A at the specified resource setting or disable the option.
- **Embedded Mouse Port**—Enables you to either enable the embedded mouse at the specified resource setting or disable the option.
- **Integrated Diskette Controller**—Enables you to enable or disable the floppy controller.
- **NUMLOCK Power-On State**—Enables you to enable or disable the keyboard NUMLOCK feature at server startup.
- **Embedded NIC PXE Support**—Enables you to enable or disable PXE support for the NIC.
- **Diskette Write Control**—Enables you to configure the write control of the removable media drive (diskette drive). The options are read and write or read only.
- **Diskette Boot Control**—Enables you to have the system boot from the removable media device (diskette drive).

PCI-X devices

The PCI-X Devices menu option enables you to view and assign the IRQs for all PCI-X devices.

Standard boot order (IPL)

The Standard Boot Order (IPL) menu option enables you to configure the order of devices used to start an operating system. This feature can be set to select which device the system scans first.

Date and time

The Date and Time menu option enables you to set the system date and time.

Server passwords

The Server Passwords menu enables you to set up passwords to limit access to the system and its setup options. The following selections are available in this menu:

- **Administrator Password**—Enables you to assign an administrator password. This password prevents unauthorized users from modifying the setup options.
- **Power-On Password**—Enables you to assign a power-on password. This password prevents unauthorized users from powering on the system.
- **Network Server Mode**—Enables you to disable or enable the capability of the system to boot with a locked keyboard or without a keyboard. To unlock the keyboard, enter the Power-On Password.
- **QuickLock**—Enables you to lock the keyboard and prompts you for the power-on password to unlock the keyboard.

IMPORTANT: If you forget your password, you can clear all passwords by resetting the system maintenance switch. Refer to “System board switches” in Appendix E, “System LEDs and switches.”

Automatic Server Recovery

The Automatic Server Recovery menu includes the following items:

- Automatic Server Recovery—Enables you to enable or disable the Automatic Server Recovery option.
- Thermal Shutdown—Enables you to disable or enable the system automatic shutdown feature caused by a thermal caution event. This option is enabled by default. HP does not recommend disabling this feature.

Server asset tags

The Server Asset Tags menu enables you to access the Server Info Text. Server Info Text enables you to identify the system with an asset tracking number.

Advanced options

The Advanced Options menu enables you to configure advanced options of the system. The following selections are available in this menu:

- MPS Table Mode—Enables you to change the APIC table setting. The APIC table setting is automatically set by the OS Selection setting.
- POST Speed Up—Enables you to enable or disable the complete memory test.
- Wake On LAN—Enables you to enable or disable Wake On LAN Support.
- Erase Non-Volatile Memory—Enables you to reset the configuration settings to their factory defaults.
- Node Interleaving—Enables you to enable or disable node interleaving.
- Advanced ECC Support—Sets the system to use the standard four-way DIMM configuration.

Utility language

The Utility Language menu enables you to set the display language for RBSU. The following choices are available:

- English
- French
- Italian
- German
- Spanish
- Japanese

The following table identifies the default settings for options in primary RBSU menus. For a complete explanation of RBSU features and functions, refer to the *ROM-Based Setup Utility User Guide* on the Documentation CD.

Table 5-1: RBSU default settings

Menu/option	Default setting
System Options	
OS Selection	Windows Server 2003
Embedded COM Port A	COM 1; IRQ 4
Integrated Diskette Controller	Enabled
NUMLOCK Power-On State	Off
NIC PXE Support	Enabled
Diskette Read/Write Control	Read and write
Diskette Boot Control	Enabled
IPL Standard Boot Order	
CD-ROM	IPL: 1
Diskette Drive (A:)	IPL: 2
Hard Drive (C:)	IPL: 3
PXE	IPL: 4
Server Passwords	
Set Administrator Password	None
Set Power-On Password	None
Network Server Mode	Disabled
QuickLock	Disabled
Automatic Server Recovery	
ASR Status	Enabled
ASR Timeout	10 minutes
Thermal Shutdown	Enabled

continued

Table 5-1: RBSU default settings *continued*

Menu/option	Default setting
Server Asset Tags	
Server Info Text	None
Advanced Options	
MPS Table Mode	AutoSet Table
Post Speed Up	Enabled
POST F1 Prompt	Enabled
Wake On LAN	Disabled
ROM Selection	Use current ROM
Erase Non-volatile Memory	Off
Set CPU Corrected	None (select 1 or 2)
NMI Debug Button	Enabled
Custom POST Message	None
Advanced ECC Support	Enabled

Enhanced auto-configuration process

During the power-up sequence that occurs the first time that the server is booted, the system ROM automatically configures the entire system without any user intervention.

By default setting, the system is configured for Microsoft Windows Server 2003. To change any default settings in the auto-configuration process, load RBSU by pressing the **F9** key when prompted during POST. This action enables you to select the language, operating system, and primary boot controller for the server. When these settings are set according to your preference, exit RBSU and reboot the server.

The system then attempts to boot first from a bootable CD before booting from the hard drive. For normal operating system installation, insert the operating system installation CD into the CD-ROM drive. If the ProLiant Essentials Foundation Pack supports an assisted installation for the operating system you are installing, insert the ProLiant Essentials CD into the CD-ROM drive for an assisted installation.

If a POST error occurs, the system halts, pending a user selection from the menu. To continue the boot process, press the **F1** key, or select one of the other options on the menu.

Integrated Lights-Out technology

Integrated Lights-Out (iLO) is a standard component of selected ProLiant servers that provides server health and remote server manageability. The iLO subsystem includes an intelligent microprocessor, secure memory, and a dedicated network interface. This design makes iLO independent of the host server and its operating system. The iLO subsystem provides remote access to any authorized network client, sends alerts, and provides other server management functions.

Using iLO, you can:

- Remotely power up, power down, or reboot the host server
- Send alerts from iLO, regardless of the state of the host server
- Access advanced troubleshooting features through the iLO interface
- Diagnose iLO using HP Systems Insight Manager (HP SIM) through a Web browser and SNMP alerting

For more information about iLO features, refer to the *Integrated Lights-Out User Guide* on the Documentation CD or on the HP website at <http://www.hp.com/servers/lights-out>.

Integrated Lights-Out ROM-Based Setup Utility

HP recommends using iLO RBSU to configure and set up iLO. iLO RBSU is designed to assist you with setting up iLO on a network; it is not intended for continued administration.

To run iLO RBSU:

1. Restart or power up the server.
2. Press the **F8** key when prompted during POST. The iLO RBSU runs.
3. Select **Administer User Accounts>Configure iLO Settings**. Enter a valid iLO user ID and password with the appropriate iLO privileges. Default account information is located on the iLO Default Network Settings tag.
4. Make and save any necessary changes to the iLO configuration.

5. Exit iLO RBSU.

HP recommends using DNS/DHCP with iLO to simplify installation. If DNS/DHCP cannot be used, use the following procedure to disable DNS/DHCP and to configure the IP address and the subnet mask:

1. Restart or power up the server.
2. Press the **F8** key when prompted during POST. The iLO RBSU runs.
3. Select **Administer User Accounts>Configure iLO Settings**. Enter a valid iLO user ID and password with the appropriate iLO privileges. Default account information is located on the iLO Default Network Settings tag.
4. Select **Network>DNS/DHCP**, and press the **Enter** key.
5. Select **DHCP Enable**. Press the spacebar to turn off DHCP. Be sure that DHCP Enable is set to Off, and save the changes.
6. Select **Network>NIC and TCP/IP**, and press the **Enter** key.
7. Enter the appropriate information in the following fields:
 - IP Address
 - Subnet Mask
 - Gateway IP Address
8. Save the changes. The iLO system automatically resets to use the new setup when you exit iLO RBSU.

Redundant ROM support

The server enables you to upgrade or configure the ROM safely with redundant ROM support. The server has 4 MB of ROM that acts as two separate 2-MB ROMs. In the standard implementation, one portion of the ROM contains the current ROM program version, while another portion of the ROM contains a backup version.

Safety and security benefits

When you flash the system ROM, ROMPaq writes over the backup ROM and saves the current ROM as a backup, enabling you to switch easily to the existing ROM version if the new ROM becomes corrupted for any reason. This feature protects the existing ROM version, even if you experience a power failure while flashing the ROM.

Accessing redundant ROM settings

1. Access RBSU by pressing the **F9** key when prompted during POST.
2. Select **Advanced Options**.
3. Select **Redundant ROM**.
4. Select one of the ROM banks as the system ROM.
5. Press the **Enter** key.
6. Press the **Esc** key to exit the current menu, or press the **F10** key to exit RBSU.
7. Restart the server.

When the server boots, the system identifies whether the current ROM bank is corrupt. If a corrupt ROM is detected, the system boots from the backup ROM and alerts you through POST or IML that the ROM bank is corrupt.

ROMPaq utility

Flash ROM enables you to upgrade the firmware (BIOS) with system or option ROMPaq utilities. To upgrade the BIOS, insert a ROMPaq diskette into the diskette drive and boot the system.

The ROMPaq utility checks the system and provides a choice (if more than one exists) of available ROM revisions. By default, the oldest ROM version is updated. This procedure is the same for both system and option ROMPaq utilities.

If a power loss occurs during a firmware upgrade, redundant ROM support enables data recovery.

System Online ROM flash component utility

The Online ROM Flash Component Utility enables system administrators to efficiently upgrade system or controller ROM images across a wide range of servers and array controllers. This tool has the following features:

- Works offline and online
- Supports Microsoft Windows NT®, Windows 2000, Windows Server 2003, Novell Netware, and Linux operating systems

IMPORTANT: This utility supports operating systems that may not be supported by the server. For operating systems supported by the server, refer to the website at <http://hp.com/go/supportos>.

- Integrates with other software maintenance, deployment, and operating system tools
- Automatically checks for hardware, firmware, and operating system dependencies, and installs only the correct ROM upgrades required by each target server

ROM legacy USB support

When using operating systems that support USB, the server supports USB devices, including, but not limited to:

- CD-ROM drives
- Diskette drives
- Keyboard
- Mouse

For other operating systems, the ROM provides USB support for keyboard and mouse, but not for CD-ROM or diskette drives.

ROM legacy USB support is available during POST, DOS, and while the operating system is running. The ROM does not support hot-plug events for the USB keyboard or USB mouse at any time. The maximum device support is two USB keyboards, two USB mouse devices, and one layer of hubs.

IMPORTANT: The ProLiant Essentials Foundation Pack Windows 95 environment does not support a USB mouse. During the ProLiant Essentials process, you must use a legacy PS/2 mouse.

For a list of operating systems supported by the ProLiant DL585 server, refer to the operating system support matrix on the product website at <http://hp.com/go/supportos>.

To determine whether an operating system supports a particular feature, refer to the operating system feature matrix on the operating system support page on the HP website.

ProLiant Essentials Foundation Pack

The ProLiant Essentials Foundation Pack contains the essential software every customer needs to install, configure, and manage ProLiant servers as part of an adaptive infrastructure.

Ships as standard

The foundation of an adaptive infrastructure is built on the software contained in the ProLiant Essentials Foundation Pack, which is provided with all ProLiant servers at no charge. This software is an intrinsic component of every ProLiant solution.

Single source

The Foundation Pack provides all the essential software needed to set up a reliable, well-integrated, fully managed server. It includes the Management CD, which contains the Intelligent Manageability products, including HP SIM, Management Agents, and ActiveUpdate. For ProLiant DL585 servers, the Foundation Pack also includes the SmartStart CD, which contains the SmartStart application and system utilities and operating system support software. Appropriate instructions on how to use the enclosed CDs, as well as where to obtain additional information and any required licenses, are also provided to complete the Foundation Pack.

Regular updates

The latest version of the software in the foundation pack can be accessed by visiting the website <http://www.compaq.com/manage>.

Complementing the Foundation Pack, you can also find and download several extra tools there, including:

- SmartStart Scripting Toolkit—Extends the power of SmartStart across large-scale deployments of hundreds or thousands of servers.
- Integration Agents for HP SIM—For customers who have invested in popular management frameworks, enables integration of Intelligent Management capabilities into those frameworks.

- Legacy Intelligent Manageability products—Many legacy products that originally shipped on the SmartStart or Management CDs can still be downloaded from the Web.

Subscription service

For more information or to apply, call 1-800-573-1099 or visit the website <http://www.hp.com/servers/smartstart>.

SmartStart Scripting Toolkit

The SmartStart Scripting Toolkit is a set of DOS-based utilities that enables you to configure and deploy servers in a customized, predictable, and unattended manner. These utilities provide scripted server and array replication for mass server deployment and duplicate the configuration of a configured source server onto target systems with minimum user interaction.

The Configuration Replication Utility is a stand-alone DOS utility that duplicates the settings of an operating RBSU-configured server by saving the server configuration to a scripted file. You can edit and modify settings in the scripted file at the subset level. For example, you can change ASR settings without having to change settings for boot controller order.

For more information, refer to the *SmartStart Scripting Toolkit User Guide*.

HP Systems Insight Manager

HP SIM is a Web-based application that enables you to accomplish normal administrative tasks from any remote location, using a Web browser. HP SIM provides device management capabilities that consolidate and integrate management data from HP and third-party devices.

IMPORTANT: You must install and use HP SIM to benefit from the pre-failure warranties on processors, hard drives, and memory modules.

For additional information, refer to the Management CD in the HP ProLiant Essentials Foundation Pack.

HP Insight Diagnostics

The HP Insight Diagnostics utility displays information about the server hardware and tests the system to be sure it is operating properly. The utility has online help and can be accessed using the SmartStart CD. Online Diagnostics for Microsoft Windows is available for download from the HP website <http://www.hp.com/support>.

Automatic Server Recovery

ASR is a feature that causes the system to restart when a catastrophic operating system error occurs, such as a blue-screen, ABEND (abnormal end), or panic. A system fail-safe timer, the ASR timer, starts when the System Management driver, also known as the health driver, is loaded. When the operating system is functioning properly, the system periodically resets the timer. However, when the operating system fails, the timer expires and restarts the server.

ASR increases server availability by restarting the server within 10 minutes after a system hang or shutdown. At the same time, the HP SIM console notifies you by sending a message to a designated pager number that ASR has restarted the system. You can disable ASR from the HP SIM console or RBSU.

Integrated Management Log

The IML records hundreds of events and stores them in an easy-to-view form. The IML timestamps each event with one-minute granularity.

You can view recorded events in the IML in several ways, including:

- From within HP SIM
- From within Survey Utility
- From within operating system-specific IML viewers
 - For NetWare: IML Viewer
 - For Windows: Event Viewer or IML Viewer
 - For Linux: IML Viewer Application
- From within HP Insight Diagnostics

For more information, refer to the Management CD in the HP ProLiant Essentials Foundation Pack.

Regulatory compliance notices

Regulatory compliance model number

For the purpose of regulatory compliance certifications and identification, your product has been assigned a unique regulatory model number. The regulatory model number can be found on the product nameplate label, along with all required approval markings and information. When requesting compliance information for this product, always refer to this regulatory model number. The regulatory model number is not the marketing name or model number of the product.

Federal Communications Commission notice

Part 15 of the Federal Communications Commission (FCC) Rules and Regulations has established Radio Frequency (RF) emission limits to provide an interference-free radio frequency spectrum. Many electronic devices, including computers, generate RF energy incidental to their intended function and are, therefore, covered by these rules. These rules place computers and related peripheral devices into two classes, A and B, depending upon their intended installation. Class A devices are those that may reasonably be expected to be installed in a business or commercial environment. Class B devices are those that may reasonably be expected to be installed in a residential environment (for example, personal computers). The FCC requires devices in both classes to bear a label indicating the interference potential of the device as well as additional operating instructions for the user.

The FCC rating label on the device shows the classification (A or B) of the equipment. Class B devices have an FCC logo or FCC ID on the label. Class A devices do not have an FCC logo or FCC ID on the label. After the Class of the device is determined, refer to the corresponding statement in the following sections.

Class A equipment

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at personal expense.

Class B equipment

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit that is different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Declaration of conformity for products marked with the FCC logo, United States only

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For questions regarding your product, contact us by mail or telephone:

- Hewlett-Packard Company
P. O. Box 692000, Mail Stop 530113
Houston, Texas 77269-2000
- 1-800-HP-INVENT (1-800-474-6836) (For continuous quality improvement, calls may be recorded or monitored.)

For questions regarding this FCC declaration, contact us by mail or telephone:

- Hewlett-Packard Company
P. O. Box 692000, Mail Stop 510101
Houston, Texas 77269-2000
- 1-281-514-3333

To identify this product, refer to the part, series, or model number found on the product.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Hewlett-Packard Company may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods in order to maintain compliance with FCC Rules and Regulations.

Canadian notice (Avis Canadien)

Class A equipment

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Class B equipment

This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

Mouse compliance statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

European Union regulatory notice



This product complies with the following EU Directives:

- Low Voltage Directive 73/23/EEC
- EMC Directive 89/336/EEC

CE Compliance of this product is valid only if powered with the correct HP-provided and CE marked AC adapter.

If this product has telecommunication functionality, it also complies with the essential requirements of:

- R&TTE Directive 1999/5/EC



*For a notified body number refer to the product regulatory label.

Japanese notice

ご使用になっている装置にVCCIマークが付いていましたら、次の説明文をお読み下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスB情報技術装置です。この装置は、家庭環境で使用することを目的としていますが、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起こすことがあります。
取扱説明書に従って正しい取り扱いをして下さい。

VCCIマークが付いていない場合には、次の点にご注意下さい。

この装置は、情報処理装置等電波障害自主規制協議会（VCCI）の基準に基づくクラスA情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

BSMI notice

警告使用者：

這是甲類的資訊產品，在居住的環境中使用時，可能會造成射頻干擾，在這種情況下，使用者會被要求採取某些適當的對策。

Korean notices

Class A equipment

A급 기기 (업무용 정보통신기기)

이 기기는 업무용으로 전자파적합등록을 한 기기이오니 판매자 또는 사용자는 이 점을 주의하시기 바라며, 만약 잘못판매 또는 구입하였을 때에는 가정용으로 교환하시기 바랍니다.

Class B equipment

B급 기기 (가정용 정보통신기기)

이 기기는 가정용으로 전자파적합등록을 한 기기로서 주거지역에서는 물론 모든지역에서 사용할 수 있습니다.

Laser compliance

This product may be provided with an optical storage device (that is, CD or DVD drive) and/or fiber optic transceiver. Each of these devices contains a laser that is classified as a Class 1 Laser Product in accordance with US FDA regulations and the IEC 60825-1. The product does not emit hazardous laser radiation.



WARNING: Use of controls or adjustments or performance of procedures other than those specified herein or in the laser product's installation guide may result in hazardous radiation exposure. To reduce the risk of exposure to hazardous radiation:

- **Do not try to open the module enclosure. There are no user-serviceable components inside.**
 - **Do not operate controls, make adjustments, or perform procedures to the laser device other than those specified herein.**
 - **Allow only HP Authorized Service technicians to repair the unit.**
-

The Center for Devices and Radiological Health (CDRH) of the U.S. Food and Drug Administration implemented regulations for laser products on August 2, 1976. These regulations apply to laser products manufactured from August 1, 1976. Compliance is mandatory for products marketed in the United States.

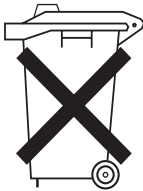
Battery replacement notice

Your computer is equipped with an internal lithium battery or battery pack. There is a danger of explosion and risk of personal injury if the battery is incorrectly replaced or mistreated. Unless specific replacement instructions are provided as part of this guide, replacement is to be done by an authorized service provider using the HP spare designated for this product. For more information about battery replacement or proper disposal, contact your authorized reseller or your authorized service provider.



WARNING: Your computer contains an internal lithium battery or battery pack. There is risk of fire and burns if the battery pack is not properly handled. To reduce the risk of personal injury:

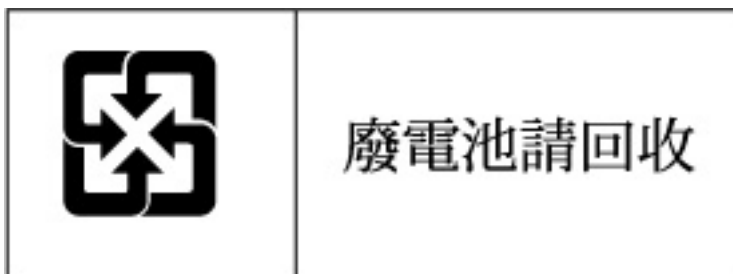
- Do not attempt to recharge the battery.
 - Do not expose to temperatures higher than 60°C.
 - Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.
 - Replace only with the HP spare designated for this product.
-



Batteries, battery packs, and accumulators should not be disposed of together with the general household waste. To forward them to recycling or proper disposal, please use the public collection system or return them to HP, your authorized HP partners, or their agents.

Taiwan battery recycling notice

The Taiwan EPA requires dry battery manufacturing or importing firms in accordance with Article 15 of the Waste Disposal Act to indicate the recovery marks on the batteries used in sales, giveaway or promotion. Contact a qualified Taiwanese recycler for proper battery disposal.



Disposing of waste electrical and electronic equipment



This symbol on the product or on its packaging indicates that this product must not be disposed of with your other household waste. Instead, it is your responsibility to dispose of your waste equipment by handing it over to a designated collection point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or the shop where you purchased the product.

Power cord statement for Japan

製品には、同梱された電源コードをお使い下さい。
同梱された電源コードは、他の製品では使用出来ません。

Electrostatic discharge

To prevent damaging the system, be aware of the precautions you need to follow when setting up the system or handling parts. A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

Preventing electrostatic damage

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm \pm 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heel straps, toe straps, or bootstraps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.
- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.

If you do not have any of the suggested equipment for proper grounding, have an authorized reseller install the part.

NOTE: For more information on static electricity or for assistance with product installation, contact your authorized reseller.

System battery

The servers have memory devices that require a battery to retain stored information.

Battery replacement

When the server no longer automatically displays the correct date and time, you might need to replace the battery that provides power to the real-time clock. Under normal use, battery life is usually about five to 10 years. Use an HP 220-mAh lithium, 3-V replacement battery.

To install a new battery:

1. Power down the server. Refer to “Powering down the server” in Chapter 2, “Server operations.”
2. Extend the server from the rack. Refer to “Extending the server from the rack” in Chapter 2, “Server operations.”
3. Remove the access panel. Refer to “Removing the access panel” in Chapter 2, “Server operations.”
4. Locate the battery on the system board.

NOTE: It might be necessary to remove some PCI-X expansion boards to gain access to the battery.

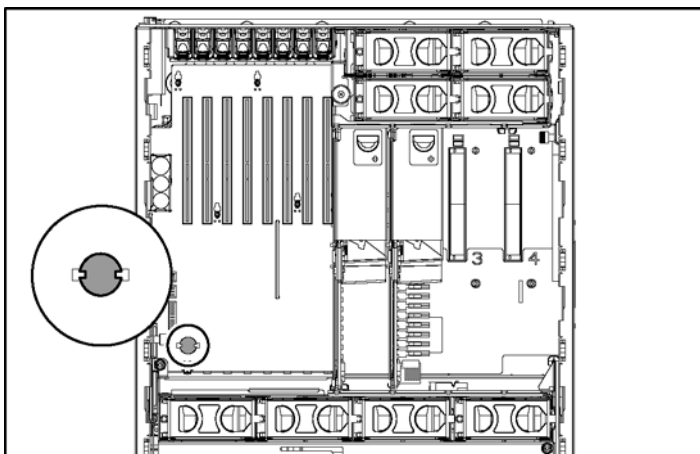


Figure C-1: Battery location on the system board

5. Remove the existing battery.

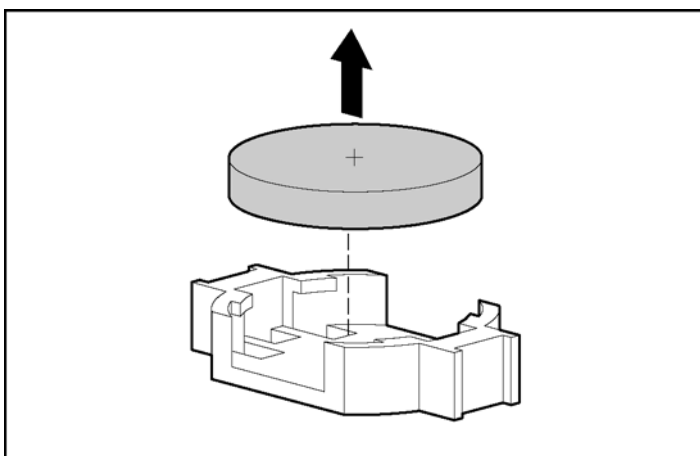


Figure C-2: Removing a battery

6. Install the new battery.

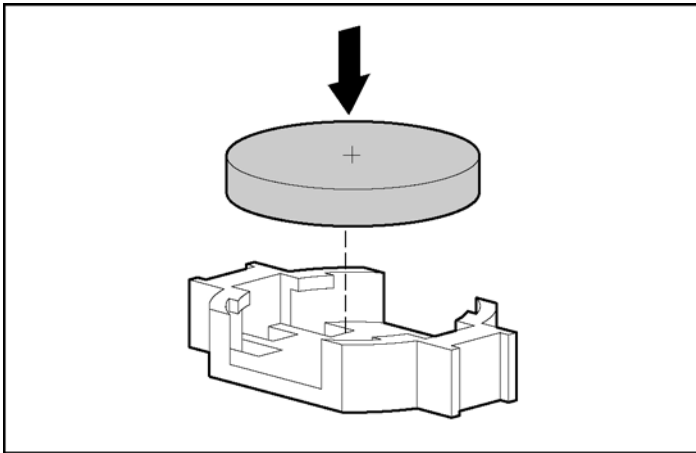


Figure C-3: Installing a new battery

7. Install the access panel.
8. Restore the server to its operating position in the rack.
9. Run RBSU to reconfigure the system if the settings were lost.

Cabling guidelines

Cabling a SCSI controller



CAUTION: Route the SCSI cables through the SCSI cable guides on the front fan cage to prevent damage to the SCSI cables.

Cabling an optional SCSI controller to the 4 x 1 drive cage in duplex mode

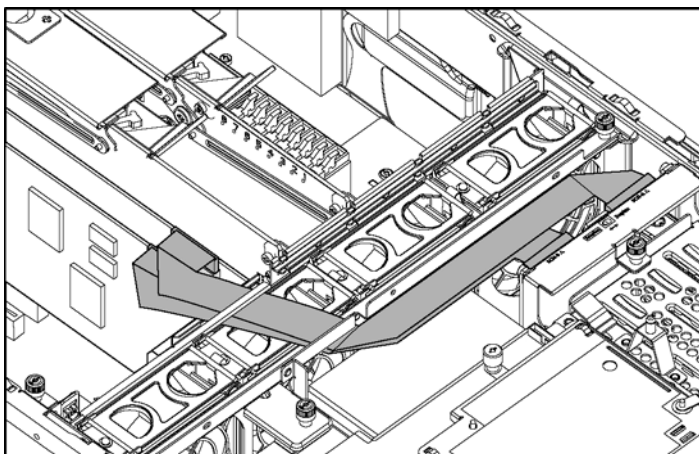


Figure D-1: Cabling a SCSI controller (duplex mode)

Cabling an optional SCSI controller to the 4 x 1 drive cage in simplex mode

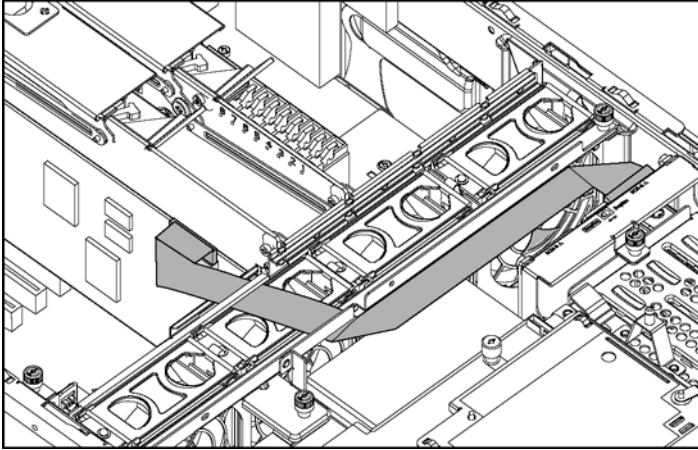


Figure D-2: Cabling a SCSI controller (simplex mode)

Cabling the optional SAS hard drive cage

Connecting and routing the cables

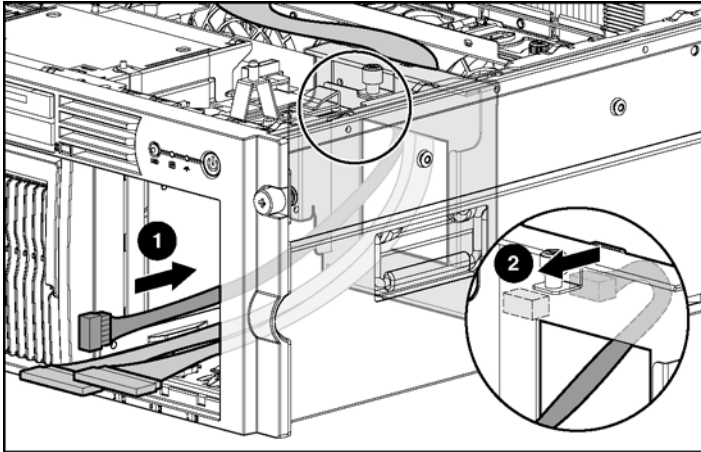


Figure D-3: Connecting and routing the SAS or SATA power and data cables

Cabling the optional SAS or SATA controller

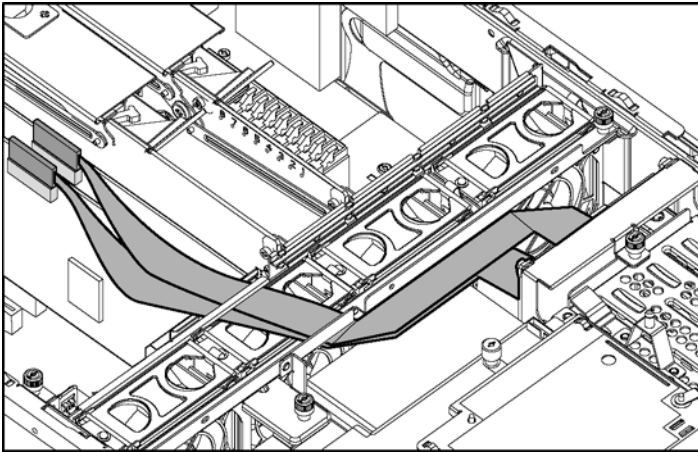


Figure D-4: Cabling the SAS hard drive cage to the controller

Cabling the BBWCE

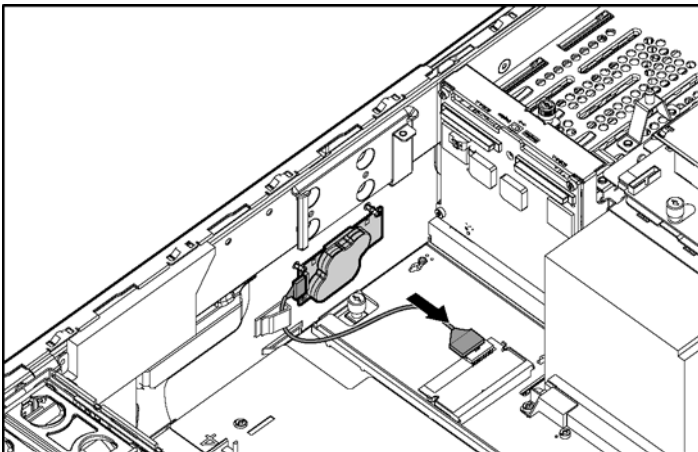


Figure D-5: Cabling the BBWCE module to the 5i Plus Memory Module

System LEDs and switches

This appendix provides information about locating and using system LEDs and switches in the server. For additional information about troubleshooting procedures, refer to Appendix H, “Troubleshooting.”

System LEDs

The server contains several sets of LEDs that indicate the status and settings of hardware components. This appendix discusses the following types and locations of LEDs:

- Front panel
- Hot-plug SCSI hard drive
- Hot-plug SAS or SATA hard drives
- Hot-plug fans
- Hot-plug power supplies
- NIC
- BBWCE
- QuickFind diagnostic display

Front panel LEDs

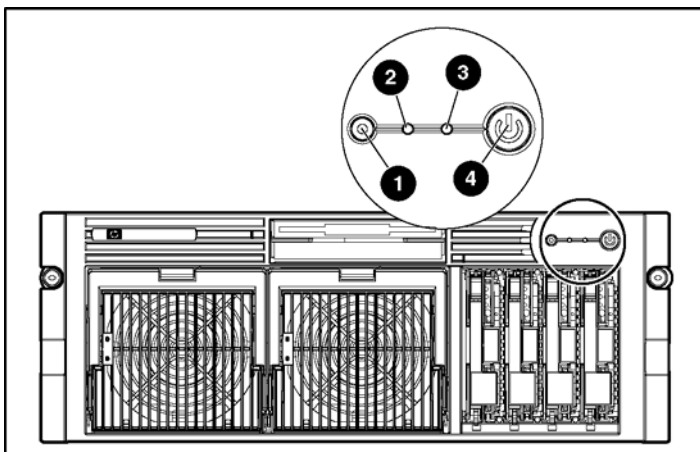


Figure E-1: Front panel LEDs

Table E-1: Front panel LEDs

Item	Description	Status
1	Unit identification	Blue = Activated Blue flashing = System being managed remotely Off = Deactivated
2	Internal health	Green = Normal
3	External health	Red = System critical Amber = System degraded Off = System off/Standby
4	Power	Green = On Amber = Off (auxiliary power only) Off = Power cord not attached to the server or power supply failure

Hot-plug SCSI hard drive LEDs

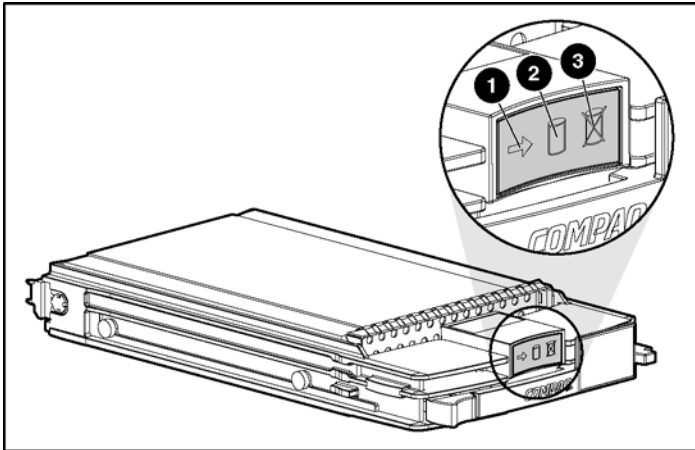


Figure E-2: Hot-plug SCSI hard drive LEDs

Table E-2: Hot-plug SCSI hard drive LEDs

Item	Description	Status
1	Drive activity	On = Drive activity Flashing = High activity on the drive or drive is being configured as part of an array Off = No drive activity
2	Online status	On = Drive is part of an array and is currently working Flashing = Online activity Off = No online activity
3	Fault status	On = Drive failure Flashing = Fault process activity Off = No fault process activity

Table E-3: Hot-plug SCSI hard drive LED combinations

Activity LED	Online LED	Fault LED	Status
On	Off	Off	Do not remove the drive. Removing a drive during this process causes data loss. The drive is being accessed and is not configured as part of an array.
On	Flashing	Off	Do not remove the drive. Removing a drive during this process causes data loss. The drive is rebuilding or undergoing capacity expansion.
Flashing	Flashing	Flashing	Do not remove the drive. Removing a drive during this process causes data loss. The drive is part of an array being selected by the Array Configuration Utility. -Or- The Options ROMPaq is upgrading the drive.
Off	Off	Off	OK to replace the drive online if a predictive failure alert is received, and the drive is attached to an array controller. The drive is not configured as part of an array. -Or- If this drive is part of an array, then a powered-on controller is not accessing the drive. -Or- The drive is configured as an online spare.
Off	Off	On	OK to replace the drive online. The drive has failed and has been placed off-line.
Off	On	Off	OK to replace the drive online if a predictive failure alert is received (refer to the following section for details), provided that the array is configured for fault tolerance and all other drives in the array are online. The drive is online and configured as part of an array.
On or flashing	On	Off	Do not remove the drive. Removing a drive during this process causes data loss. The drive is online and being accessed.

Hot-plug SAS or SATA hard drive LEDs

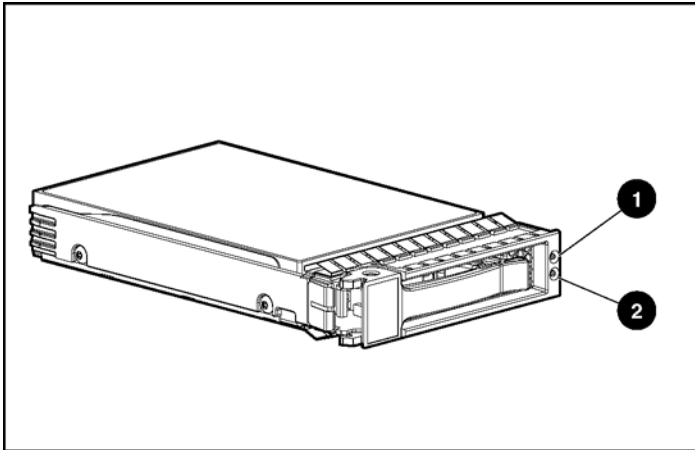


Figure E-3: Hot-plug SAS or SATA hard drive LEDs

Table E-4: Hot-plug SAS or SATA hard drive LEDs

Item	Description	Status
1	Fault/UID status	Amber = Drive failure Flashing amber = Fault process activity Blue = Unit identification is active Off = No fault process activity
2	Online/Activity Status	Green = Drive activity Flashing green = High activity on the drive or drive is being configured as part of an array Off = No drive activity

Table E-5: Hot-plug SAS or SATA hard drive LED combinations

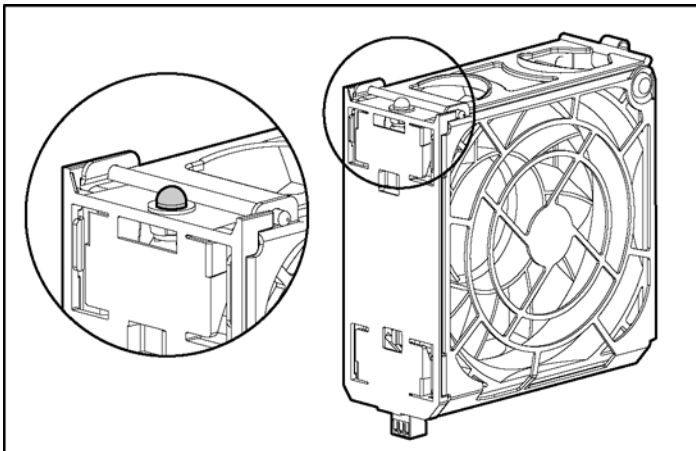
Online/Activity LED (green)	Fault/UID LED (amber/blue)	Interpretation
On, off, or flashing	Alternating amber and blue	The drive has failed, or a predictive failure alert has been received for this drive. It also has been selected by a management application.
On, off, or flashing	Steadily blue	The drive is operating normally, and it has been selected by a management application.
On	Amber, flashing regularly (1 Hz)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
On	Off	The drive is online, but it is not active currently.
Flashing regularly (1 Hz)	Amber, flashing regularly (1 Hz)	Do not remove the drive. Removing a drive may terminate the current operation and cause data loss. The drive is part of an array that is undergoing capacity expansion or stripe migration, but a predictive failure alert has been received for this drive. To minimize the risk of data loss, do not replace the drive until the expansion or migration is complete.
Flashing regularly (1 Hz)	Off	Do not remove the drive. Removing a drive may terminate the current operation and cause data loss. The drive is rebuilding, or it is part of an array that is undergoing capacity expansion or stripe migration.
Flashing irregularly	Amber, flashing regularly (1 Hz)	The drive is active, but a predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Flashing irregularly	Off	The drive is active, and it is operating normally.

continued

Table E-5: Hot-plug SAS or SATA hard drive LED combinations *continued*

Online/Activity LED (green)	Fault/UID LED (amber/blue)	Interpretation
Off	Steadily amber	A critical fault condition has been identified for this drive, and the controller has placed it offline. Replace the drive as soon as possible.
Off	Amber, flashing regularly (1 Hz)	A predictive failure alert has been received for this drive. Replace the drive as soon as possible.
Off	Off	The drive is offline, a spare, or not configured as part of an array.

Hot-plug fan LED

**Figure E-4: Hot-plug fan LED****Table E-6: Hot-plug fan LED**

LED Status	Description
Off	Power is not applied to the fan
Green	Power is applied to the fan and the fan is functional
Amber	Fan failure

Hot-plug power supply LEDs

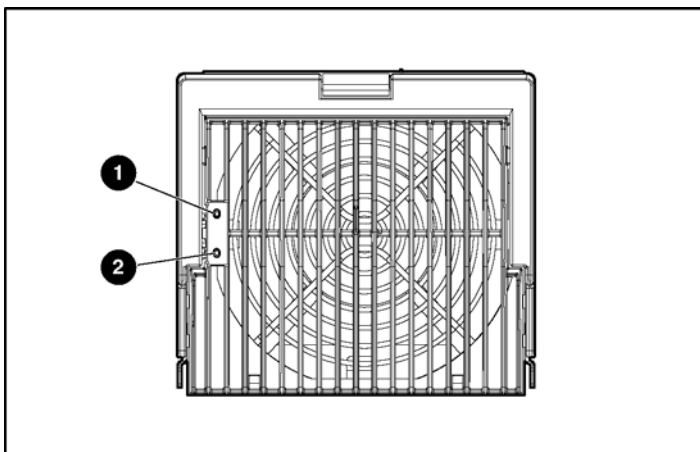


Figure E-5: Hot-plug power supply LEDs

Table E-7: Hot-plug power supply LED combinations

1 Power LED (green)	2 Fault LED (amber)	Status
Off	Off	No AC power
Off	On	No power to this specific power supply -Or- Power supply failure
Blinking	Off	AC power present System in standby mode
On	Off	Power supply on and working properly
On	Blinking	Power supply current limit exceeded

NIC LEDs

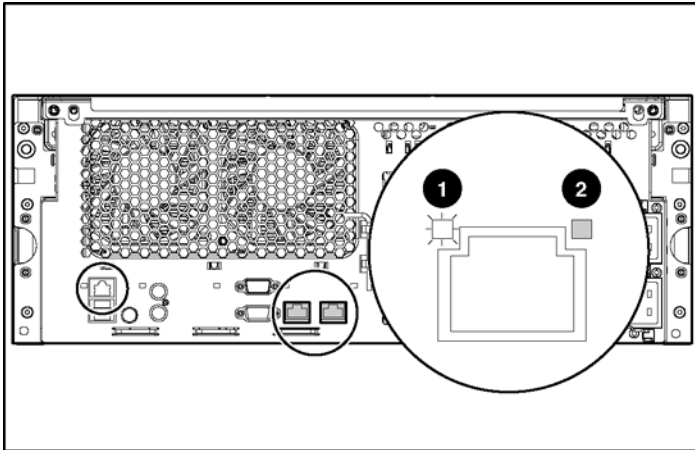


Figure E-6: NIC LEDs

Table E-8: NIC LEDs

Item	Description	LED color	Status
1	Activity LED	Green	On or flashing = Network activity Off = No network activity
2	Link LED	Green	On = Linked to the network Off = Not linked to the network

BBWCE LEDs

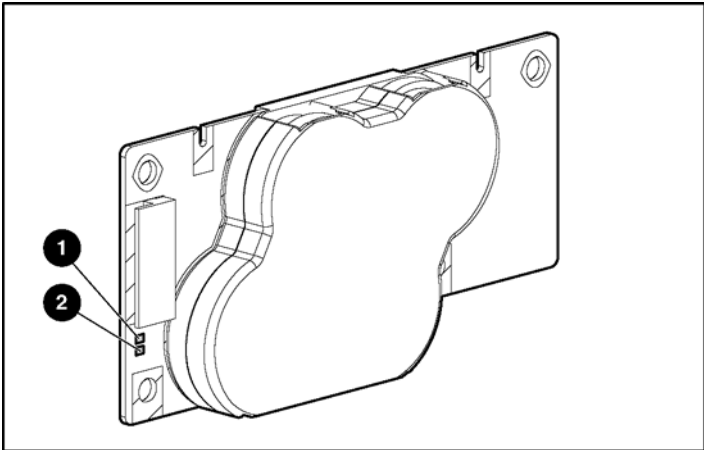


Figure E-7: BBWCE LEDs

Table E-9: BBWCE LED descriptions

Server status	LED color	LED status	Battery module status
Server is on and has normal run time	Green (2)	On	Fast charging
	Green (2)	Off	Trickle-charging
	Amber (1)	On	Short in the connection of one or more of the four button cells within the battery module
	Amber (1)	Blinking	Open in the circuit between the positive and negative terminals of the battery module
	Amber (1)	Off	Battery module status is normal

continued

Table E-9: BBWCE LED descriptions *continued*

Server status	LED color	LED status	Battery module status
Server is on and is in the first 30 seconds after power-up	Amber (1) or green (2)	On	Temporary lock-out state; data was lost due to cable being detached
Server is off and is in data retention mode	Amber (1)	Blinking every 15 seconds	User data held in write cache is being backed up



CAUTION: After the server is powered down, wait 15 seconds and then check the illumination pattern of the LEDs before unplugging the cable from the battery module.

- If the amber LED blinks after 15 seconds, do not remove the cable from the battery module. This module is backing up data, and data will be lost if the cable is detached.
- If neither LED blinks after 15 seconds, it is safe to remove the cable from the battery module.

When the server is on, review the POST message before plugging or unplugging the cable from the battery module.

QuickFind diagnostic display LEDs

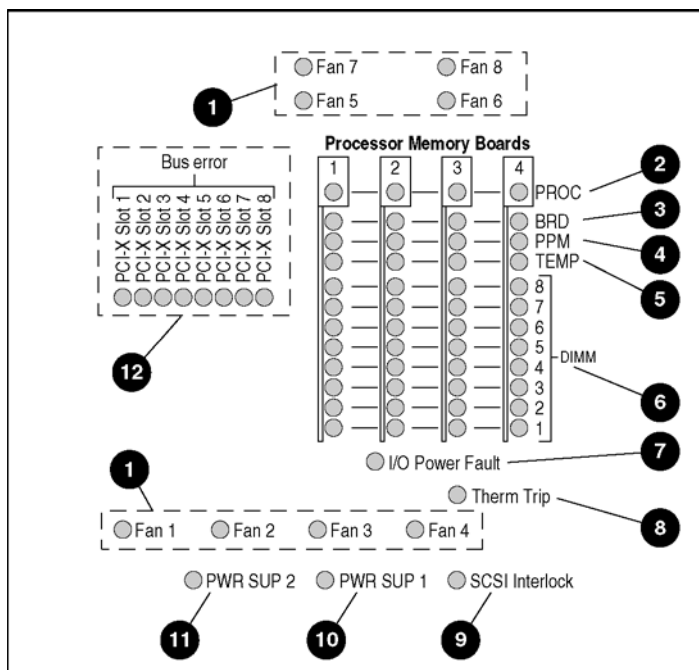


Figure E-8: QuickFind diagnostic display LEDs

Table E-10: QuickFind diagnostic display LEDs

Item	Description	Status	Action
1	Fan	Off = Normal On = Attention required	Be sure fan is installed and seated properly. If fan is installed and seated properly, replace the fan.
2	Processor	Off = Normal On = Attention required	Processor pre-failure notification. Inspect the IML logs and POST messages. Processor might need to be replaced.

continued

Table E-10: QuickFind diagnostic display LEDs *continued*

Item	Description	Status	Action
3	Processor memory board	Off = Normal On = Attention required	Processor memory board power failure. If problem persists, replace the processor or processor memory board.
4	Processor power module	Off = Normal On = Attention required	PPM power failure. If problem persists, replace PPM. If the PPM and the BRD LEDs are both on, there is a configuration error.
5	Temperature	Off = Normal On = Attention required	One or more components have experienced an elevated temperature or a thermal shutdown. A thermal shutdown is indicated by the Therm Trip LED. <ul style="list-style-type: none"> • Be sure the processor heatsink is properly attached. • Be sure there are no 1.7" DIMMs installed that prevent airflow across the processor heatsink). • Be sure that all fans are installed and working properly. • Be sure that the server environment meets posted requirements. For information about server environment requirements refer to the "Optimum environment" section in Chapter 3.
6	DIMM	Off = Normal On = Attention required	DIMM failure or configuration error. Refer to the IML or POST messages
7	I/O power fault	Off = Normal On = Attention required	A power fault on the system I/O board occurred. If problem persists, replace the system I/O board.

continued

Table E-10: QuickFind diagnostic display LEDs *continued*

Item	Description	Status	Action
8	Therm trip	Off = Normal On = Attention required	<p>The server experienced a thermal shutdown.</p> <p>If one of the CPU thermal LEDs is amber, that CPU experienced an overtemperature condition.</p> <ul style="list-style-type: none"> • Be sure that the processor heatsink is properly attached. For more information, refer to the maintenance and service guide. • Be sure the correct DIMMs (1.2-inch) are installed. • Be sure all fans are installed and working properly
9	SCSI interlock	Off = Normal On = Attention required	<p>Ensure the SCSI backplane is installed properly.</p> <p>Reseat SCSI backplane board and hard drives.</p>
10	Power supply 1	Off = Normal On = Attention required	Look at the LEDs on the front of the power supply and take the appropriate action.
11	Power supply 2	Off = Normal On = Attention required	Look at the LEDs on the front of the power supply and take the appropriate action.
12	Bus error	Off = Normal On = Attention required	<p>A bus error occurred.</p> <p>The error might have been caused by one of the adapter cards on this bus (see amber LEDs for which slots might have caused the error).</p> <p>Reseat the adapter cards.</p> <p>If problem persists, remove or replace one or both of the cards.</p>

System board switches

Some server operations, including adding or removing a component or changing a security feature, require that you reconfigure a system switch. If the system configuration is incorrect, the server might not work properly and you might receive error messages. Setting and verifying the system board switches is an important part of the overall troubleshooting process.

The server has three switch banks:

- System maintenance switch (SW3)
- System ID switch (SW4)
- iLO/Redundant ROM Override switch (SW5)

This section provides figures and tables to identify the locations, positions, functions, and settings for each of these switches.

System maintenance switch (SW3)

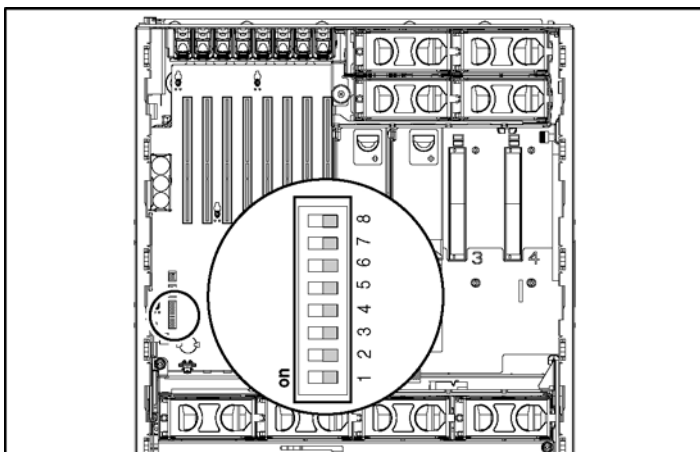



Figure E-9: System maintenance switch (SW3)

Table E-11: System maintenance switch (SW3)

Position	Default	Function	Description	Settings
1		Reserved		
2	Off	Lock configuration	Enables or disables configuration changes in nonvolatile RAM (NVRAM)	Open (off) Configuration can be changed. Closed (on) Configuration is locked and cannot be changed.
3		Reserved		
4	Off	Diskette boot override	Enables or disables booting from diskette drive Both settings enable you to read from and write to the diskette after the system completes the boot sequence.	Open (off) The diskette drive boot is controlled by the configuration. Closed (on) The diskette drive boots regardless of the configuration.

continued

Table E-11: System maintenance switch (SW3) *continued*

Position	Default	Function	Description	Settings
5	Off	Password disable	Enables or disables password protection.	Open (off) Power-on password is enabled. Closed (on) Power-on password is disabled.
6	Off	Configuration validation	Invalidates NVRAM configuration information	Open (off) NVRAM is valid. Closed (on) NVRAM is invalid, and configuration is lost.
7	Off	Reserved		
8	Off	Reserved		
 CAUTION: When maintenance mode is turned on (the maintenance switch is set to on/closed) and the system is powered up, NVRAM configuration is invalidated.				

System ID switch (SW4)

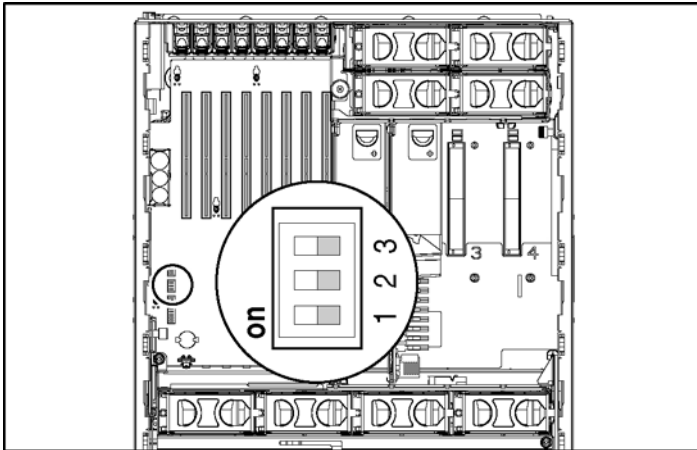


Figure E-10: System ID switch (SW4)

Table E-12: System ID switch (SW4)

Position	Description
1 through 3	Reserved

iLO/Redundant ROM override switch (SW5)

The iLO/Redundant ROM override switch (SW5) is a two-position switch that is used for miscellaneous purposes. The iLO security override switch allows you full access to the iLO processor. This access is necessary if you lost your password or if the iLO boot-block must be flashed.

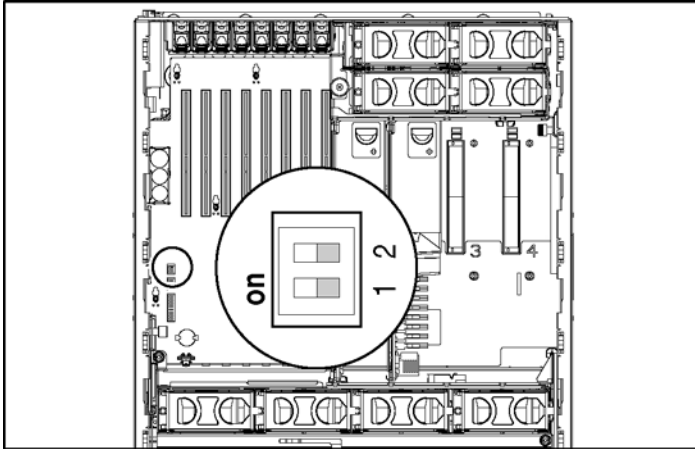


Figure E-11: iLO/Redundant ROM override switch (SW5)

Table E-13: iLO/Redundant ROM override switch (SW5)

Position	Default	Function	Description	Settings
1	Off	iLO security override	The override allows the administrator full access to the iLO processor.	Open (off) Normal Closed (on) Override
2	Off	Redundant bootblock select	Forces booting from the redundant bootblock	Open (off) Normal Closed (on) Redundant bootblock (ROM)

Server error messages

Use POST error messages to assist in troubleshooting and performing basic diagnostic functions in the server. For a complete listing of error messages and other troubleshooting information, refer to the *HP Servers Troubleshooting Guide* provided on the Documentation CD or online on the product page at <http://www.hp.com>.

Server specifications

Server specifications

This appendix provides operating and performance specifications for the server.

Table G-1: Server specifications

Feature	Units
Dimensions	
Height	17.5 cm (6.88 in.)
Depth	69.2 cm (27.25 in.)
Width	46.3 cm (19.0 in.)
Weight	30.8 kg, minimum (68 lb, minimum)
	44.5 kg, maximum (98 lb, maximum)
International input requirements	
Rated input voltage	180 V to 264 V
Rated input frequency	47 Hz to 63 Hz
Rated input current	6 A
U.S. input requirements	
Rated input voltage	90 V to 132 V
Rate input frequency	47 Hz to 63 Hz
Rated input current	12 A

continued

Table G-1: Server specifications *continued*

Feature	Units
Power supply output power	
Rated steady-state power	800 W
Maximum peak power	800 W
Temperature range	
Operating	10° to 35°C (50° to 95°F)
Non-operating	-30° to 60°C (-20° to 140°F)
Relative humidity (non-condensing)	
Operating	20% to 80%
Non-operating	5% to 90%
Maximum wet bulb temperature	38.7°C (101.7°F)
Heat dissipation	3900 BTU/Hr

Troubleshooting

This appendix provides specific troubleshooting information for the server. Use it to find details about server startup and operation errors.

For information on LEDs and switches specific to the server, refer to Appendix E, “System LEDs and switches.”

For a more detailed discussion of troubleshooting techniques, diagnostic tools, error messages, and preventative maintenance, refer to the *HP Servers Troubleshooting Guide* included on the Documentation CD that ships with the server.



WARNING: A risk of personal injury exists from hazardous energy levels. The installation of options and the routine maintenance and service of this product should be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

This appendix includes the following topics:

- If the server does not start

You are provided with initial instructions on what to try and where to go for help for the most common problems encountered during the initial POST. A successful startup requires the server to complete this test each time you power up, before the server can load the operating system and start running software applications.

- Diagnostic steps

If the server does not power up after you have performed initial troubleshooting procedures, use the tables in this section to identify possible reasons for the problem, possible solutions, and references to other sources of information.

- Problems after initial boot

After the server has passed the POST, you might still encounter errors, such as an inability to load the operating system. You are provided with instructions on what to try and where to go for help when you encounter errors after the server completes the POST.

- Other information resources

This section provides a list of reference information available for the server.

For troubleshooting information beyond the scope of this guide, both general and specific to this server, refer to Table H-8.

If the server does not start

This section provides systematic instructions on what to try and where to go for help for the most common problems encountered during initial POST. The server must first complete this test each time you power up, before it can load the operating system and start running software applications.



WARNING: A risk of personal injury exists from hazardous energy levels. The installation of options, and the routine maintenance and service of this product should be performed by individuals who are knowledgeable about the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

If the server does not start:

1. Verify that the server and monitor are plugged into a working outlet.
2. Be sure that the power source is working properly:
 - a. Verify the status using the system power LED.
 - b. Verify that the Power On/Standby button was pressed firmly.
3. Be sure that the power supplies are working properly by looking at the power supply LEDs.

NOTE: For more information about the location and status of LEDs, refer to Appendix E, "System LEDs and switches." For more information about power, refer to the *HP Servers Troubleshooting Guide*.
4. Look at the interlock LEDs on the hood label. If any LEDs are amber, reseal the component.
5. If the system does not complete POST or start loading an operating system, refer to the *HP Servers Troubleshooting Guide*.
6. If the server is rebooting repeatedly, verify that the system is not rebooting because of a problem that initiates an ASR-2 reboot. Some operating systems reboot server when an error occurs. This is the default in Windows Server 2003.
7. Restart the server.

IMPORTANT: If the server does not restart, proceed to the following section, “Diagnostic steps.”

8. Check the server for the following normal power-up sequence to verify that the system meets the minimal hardware requirements and is powered up during normal operations:
 - a. The power button LED turns from standby (amber) to on (green).
 - b. The fans start up. It is normal for the fans to initially run at full speed and then slow down.
9. Check the monitor for the following messages that verify the system meets the minimal hardware requirements and is powered up during normal operations:
 - a. ProLiant logo
 - b. BIOS information
 - c. Copyright information
 - d. Processor initialization
 - e. Multi-initiator configuration

IMPORTANT: Select the multi-initiator configuration utility (CTRL-A) only to support HP storage and clustering options.

- f. PXE initialization
- g. Option ROMs
- h. SCSI devices

The operating system loads to complete the boot process.

If the server completes POST and attempts to load the operating system, refer to the “Problems after initial boot” section in this appendix.

Diagnostic steps

If the server does not power up or powers up but does not complete POST, answer the questions in Table H-1 to determine appropriate actions based on the symptoms observed. The flow of questions reflects the usual flow of events during a power-on sequence. A flow chart following this table illustrates the recommended diagnostic steps and decision options.

According to the answers you give, you will be directed to an appropriate secondary table in this section. The table outlines possible reasons for the problem, options available to assist in diagnosis, possible solutions, and references to other sources of information.

Table H-1: Diagnostic steps

Question	Action
Question 1: Is the system power LED off?	If no, continue to question 2. If yes, refer to Table H-2.
Question 2: Is the system power LED green?	If yes, continue to question 3. If no, refer to Table H-3.
Question 3: Is the external health LED green?	If yes, continue to question 4. If no, refer to Table H-4.
Question 4: Is the internal health LED green?	If yes, continue to question 5. If no, refer to Table H-5.
Question 5: Is the monitor displaying information?	If yes, use the POST messages for further diagnosis. Refer to Table H-6 for details. If no, refer to Table H-6.

Table H-2: Is the system power LED off?

Answer	Possible reasons	Possible solutions
Yes	The system is not connected to AC power, or no AC power is available.	Be sure that the power cord is connected to the power supply.
	A power supply problem exists. The power supply might not be connected or inserted properly, it might have a damaged connector, or it might have failed.	Be sure that the power supply is undamaged and fully seated, and then verify that the power supply LED is green when you power up the server. Refer to Appendix E, "System LEDs and switches," for locations and states.
	A broken connection exists between the front panel LED assembly and the removable media board.	Be sure that the power switch cable assembly is inserted properly to the removable media board.
	The front panel LED assembly has failed.	Refer to the <i>HP Servers Troubleshooting Guide</i> for further options. If these solutions do not solve the problem, contact an authorized service provider for assistance.
No		If the system power button LED is amber, press the Power On/Standby button. Refer to Table H-3.
Note: For cabling configurations, refer to Appendix D, "Cabling guidelines." For LED locations and functions, refer to Appendix E, "System LEDs and switches."		

Table H-3: Is the system power LED green?

Answer	Possible reasons	Possible solutions
No	<p>The Power on/Standby button has not been pressed firmly.</p> <p>A power supply problem exists. The power supply might not be connected or inserted properly, it might have a damaged connector, or it might have failed.</p> <p>The system might have experienced a short.</p> <p>The front panel LED assembly has failed.</p>	<p>Firmly press the power button.</p> <p>Be sure that the power supply is undamaged, the power supply is fully seated, and the power supply LED is green.</p> <p>Look for bent connector pins and improperly seated expansion boards.</p> <p>Be sure that the front panel LED assembly cable is connected to the power backplane.</p> <p>If these solutions do not solve the problem, contact an authorized service provider for assistance.</p>
Yes		<p>If the system power button LED is green, refer to Table H-4.</p>
<p>Note: For cabling configurations, refer to Appendix D, “Cabling guidelines.” For LED locations and functions, refer to Appendix E, “System LEDs and switches.”</p>		

Table H-4: Is the external health LED green?

Answer	Possible reasons	Possible solutions
No, it is amber.	One power supply has failed; therefore, power supply redundancy is lost.	<p>Be sure that each installed power supply is securely connected to an AC power source.</p> <p>Locate the amber power supply LED to identify the failed power supply.</p> <p>Contact an authorized service provider for replacement parts and service.</p>
No, it is red.	All installed power supplies have experienced a failure.	<p>Remove all AC power from power supplies and reconnect to clear the error condition.</p> <p>Replace the power supply. Contact an authorized service provider for replacement parts and service.</p>
Yes		Refer to Table H-5 if the external health LED is green.
<p>Note: For cabling configurations, refer to Appendix D, “Cabling guidelines.” For LED locations and functions, refer to Appendix E, “System LEDs and switches.”</p>		

Table H-5: Is the internal health LED green?

Answer	Possible reasons	Possible solutions
For component failure identification (amber LED), check the hood label.		
No, it is amber.	A processor is in a pre-failure condition.	Use internal component failure LEDs on the Quickfind Diagnostic Display to identify:
	A DIMM is in a pre-failure condition.	<ul style="list-style-type: none"> • Missing components
	One memory bank is valid, but another bank is missing a DIMM.	<ul style="list-style-type: none"> • Degraded components • Failed components
	One memory bank is valid, but another bank has mismatched DIMMs installed.	<ul style="list-style-type: none"> • Improperly installed components
	One memory bank is valid, but another bank has an unsupported DIMM type installed.	For corrective procedures, refer to the maintenance and service guide on the Documentation CD that ships with the server.
	A redundant fan has failed.	Contact an authorized service provider for replacement parts and service.

continued

Table H-5: Is the internal health LED green? *continued*

Answer	Possible reasons	Possible solutions
No, it is red.	A processor has failed.	<p>Use internal component failure LEDs on the Quickfind Diagnostic Display to identify:</p> <ul style="list-style-type: none"> • Missing components • Failed components • Improperly installed components • Thermal event
	Processor 1 is not installed.	
	A processor is an unsupported type.	
	A processor does not have an associated PPM installed.	
	A PPM has failed.	<p>For corrective procedures, refer to the maintenance and service guide on the Documentation CD that ships with the server.</p> <p>Contact an authorized service provider for replacement parts and service.</p>
	A DIMM has experienced a multibit error.	
	DIMM pairs have mismatched DIMMs.	
	DIMMs are missing.	
	DIMMs are an unsupported type.	<p>Check the interlock LEDs on top of the front access panel. Be sure that all components are seated securely.</p>
	A required fan has failed.	
	A thermal event has occurred.	<p>Ensure the SCSI backplane is properly installed by reseating the SCSI backplane board and hard drives.</p>
	A component is not properly seated.	
	Interlock problem	
	Processor memory board configuration error	<p>Inspect the diagnostic LED panel to determine if one of the processor memory boards has both its PPM and BRD LEDs illuminated.</p> <p>Ensure that processor and PPM are properly installed on the processor memory board.</p>

PPM or board power fault	<p>Inspect the QuickFind diagnostic display panel to determine if one of the PPMs, processor memory boards, or system board has experienced a power fault.</p> <p>Ensure that all components are seated properly.</p> <p>If problem persists, replace the failed component.</p> <p>A PPM failure will be shown by the PPM LED being illuminated on the specific processor memory board.</p> <p>If the processor memory board BRD LED is amber, replace the processor memory board.</p> <p>If the I/O power LED is amber, replace the system I/O board.</p>
Thermal shutdown	<p>If the Therm Trip LED is amber, the system encountered an unexpected thermal shutdown.</p> <p>If one of the processor memory board TEMP LEDs is amber, ensure that the processor heatsink is properly attached, all fans are functioning properly, and that the external environment is within specified parameters. Inspect the iLO logs for any temperature-related warnings.</p>
Yes	<p>If the internal health LED is green, refer to Table H-6.</p>
<p>Note: For LED locations and functions, refer to Appendix E, “System LEDs and switches.”</p>	

Table H-6: Is the monitor displaying information?

Answer	Possible reasons	Possible solutions
No	<p>The monitor might not have power.</p> <p>Video might not be connected properly.</p> <p>NVRAM might be corrupted.</p> <p>The system ROM and redundant ROM may be corrupted.</p>	<p>Be sure that the monitor AC power cord is plugged in and that the monitor power button has been pressed.</p> <p>If a video card is installed, be sure that the video cable is properly connected.</p> <p>Verify the video connections. Refer to the <i>HP Servers Troubleshooting Guide</i>.</p> <p>Clear NVRAM. Refer to the Caution following the table. Refer to Appendix E for the correct switch setting.</p> <p>Are there any audible indicators, such as a series of beeps? A series of beeps is the audible signal indicating the presence of a POST error message. Refer to the <i>HP Servers Troubleshooting Guide</i> for a complete description of each beep sequence and the corresponding error messages.</p> <p>If these steps do not solve the problem, contact an authorized service provider for assistance.</p>
Yes		<p>Video is available for diagnosis. Determine the next action by observing POST progress and error messages. Refer to the <i>HP Servers Troubleshooting Guide</i> for a complete description of each POST error message.</p>



CAUTION: Clearing NVRAM deletes your configuration information. Refer to the server maintenance and service guide for complete instructions before performing this operation or data loss could occur.

Problems after initial boot

After the server has passed POST, you might still encounter errors, such as an inability to load the operating system. Use Table H-7 to troubleshoot server installation problems that occur after the initial boot.

Refer to the *HP Servers Troubleshooting Guide* for more information.

Table H-7: Problems after initial boot

Problem	Possible reasons	Possible solutions
System cannot load ProLiant Essentials Foundation Pack.	ProLiant Essentials Foundation Pack requirement not performed.	Check the ProLiant Essentials Release Notes provided in the ProLiant Essentials Online Reference Information on the ProLiant Essentials Foundation Pack.
	CD-ROM drive is not properly seated.	Reseat CD-ROM drive.
	Insufficient memory is available.	A rare Insufficient Memory message might display the first time ProLiant Essentials is booted on certain unconfigured systems. Cold-boot the machine with the ProLiant Essentials Foundation Pack inserted in the CD-ROM drive to correct the problem.
	Existing software is causing conflict.	Run the System Erase Utility. Read the Caution at the end of the table. Refer to the instructions in the <i>HP Servers Troubleshooting Guide</i> .

continued

Table H-7: Problems after initial boot *continued*

Problem	Possible reasons	Possible solutions
ProLiant Essentials fails during installation.	Error occurs during installation.	Follow the error information provided. If it is necessary to reinstall, run the System Erase Utility. Read the Caution at the end of the table. Refer to the instructions in the <i>HP Servers Troubleshooting Guide</i> .
	CMOS is not cleared.	Run the System Erase Utility. Read the Caution at the end of the table. Refer to the instructions in the <i>HP Servers Troubleshooting Guide</i> .
Server cannot load operating system.	Required operating system step was missed.	Follow these steps: <ol style="list-style-type: none"> 1. Note at which phase the operating system failed. 2. Remove any loaded operating system. 3. Refer to the operating system documentation. 4. Install the operating system again.
	Installation problem occurred.	Refer to the operating system documentation and to the ProLiant Essentials Release Notes on the ProLiant Essentials for Servers CD. Run RBSU and check the OS Selection menu.
	Problem was encountered with the hardware you have added to the system.	Refer to the documentation provided with the hardware. Refer to Appendix D, "Cabling guidelines" to identify correct SCSI bus cabling configuration for the unit.
	Problem was encountered with hardware added to a new configure-to-order system (where available).	You must complete the factory-installed operating system software installation before adding new hardware to the system. Be sure you are following the instructions provided in the <i>Factory-Installed Operating System Software Installation Guide</i> . Remove the new hardware, and complete the software installation. Then, reinstall the new hardware.



CAUTION: The System Erase Utility causes loss of all configuration information, as well as loss of existing data on all connected hard drives. Please read the appropriate section and the associated warning in the *HP Servers Troubleshooting Guide* before performing this operation.

Refer to the *HP Servers Troubleshooting Guide* for the following:

- Information you must collect when diagnosing software problems and to provide when contacting support
- Instructions on how to upgrade the operating system and its drivers
- Information about available recovery options and advice on minimizing downtime

Other information resources

Refer to the following additional information for help.

Table H-8: Troubleshooting resources

Resource	Description
<i>HP Servers Troubleshooting Guide</i>	This is a resource for obtaining troubleshooting information that is beyond the scope of this document. It includes general hardware and software troubleshooting information for all ProLiant servers, a complete list of error messages along with explanations of probable causes, and a list of remedial measures. This guide resides on the Documentation CD that ships with the server. To be sure that you have the most up-to-date copy of the <i>HP Servers Troubleshooting Guide</i> document, visit the product website at http://www.hp.com .
<i>HP ProLiant DL585 Server Maintenance and Service Guide</i>	This resource provides a complete list of all replacement parts available, along with instructions on removal and replacement. Locate this guide on the Documentation CD that ships with the server and on the product website at http://www.hp.com . Follow the link for maintenance and service guides, and download the document provided for the server.
Other online documentation	Product bulletin QuickSpecs OS support matrix

For additional information on warranties and service and support upgrades (Care Pack services), visit the product website at <http://www.hp.com>.

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